REMEDIAL ACTION WORK PLAN
FOR
THE SHOPS AT ATLAS PARK (PARCEL A)
GLENDALE, QUEENS

Prepared For:

ATLAS PARK LLC
8000 Cooper Avenue
Glendale, NY 11385

Prepared By:

Langan Engineering and Environmental Services, P.C.
360 West 31st Street
8th Floor
New York, New York 10001

Joel B. Landes

Joel B. Landes, P.E.

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LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

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Acronym	Definition
AOC	Area of Concern
AST	Aboveground Storage Tank
AWQS	Ambient Water Quality Standards
BCA	Brownfield Clean-up Agreement
BCP	Brownfield Clean-up Program
bgs	below grade surface
C&D	Construction and Demolition
CAMP	Community Air Monitoring Plan
CFR	Code of Federal Regulations
CPP	Community Participation Plan
CQAP	Construction Quality Assurance Plan
DER	Department of Environmental Remediation
DRO	Diesel Range Organics
ELAP	Environmental Laboratory Accreditation Program
FSP	Field Sampling Plan
GRO	Gasoline Range Organics
HASP	Health and Safety Plan
HDPE	High-Density Polyethylene
IRM	Interim Remedial Measures
LIRR	Long Island Rail Road
msl	mean seal level
MTBE	methyl tertiary butyl ether
NYCRR	NY State Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYCDEP	New York City Department of Environmental Protection
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OSHA	Occupational Safety and Health Administration
PBS	Petroleum Bulk Storage
PCB	Polychlorinated Biphenyls
PID	photoionization detector
ppb	parts per billion
PPE	Personal Protective Equipment
ppm	parts per million

Acronym	Definition
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
RSCO	Recommended Soil Clean-up Objective (NYSDEC)
SCG	Standards, Criteria, and Guidelines
SI	Site Investigation
SIR	Site Investigation Report
SMP	Soil Management Plan
SOP	Site Operations Plan
SSDS	Sub-slab Depressurization System
SVOC	Semi-Volatile Organic Compound
TAGM	Technical Administrative Guidance Memorandum (NYSDEC)
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TSDF	Treatment, Storage, and Disposal Facility
UST	Underground Storage Tank
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This Remedial Action Work Plan (RAWP) describes the proposed remedial action and remedial design components that will be implemented for Parcel A (formerly known as the "IRM Area") of the proposed mixed-use development known as "The Shops at Atlas Park". The Shops at Atlas Park (hereafter referred to as "Atlas Park)" is proposed for a 12-acre portion of a former 20-acre industrial park, which is located in Glendale, Queens County New York (see Figure 1). When completed, Atlas Park will include nearly 400,000 square feet of shopping, entertainment, dining, and office space. Refer to the Brownfield Cleanup Program (BCP) application for development details.

This RAWP has been prepared by Langan Engineering and Environmental Services, P.C. (Langan), at the request of Atlas Park, LLC (hereafter referred to as the "Owner") and the New York State Department of Environmental Conservation (NYSDEC), in accordance with the March 5, 2004 Brownfield Cleanup Agreement (BCA), and recent Amendment executed by Atlas Park, LLC on July 22, 2005 (pending execution by NYSDEC).

Pursuant to the BCA, an Interim Remedial Measures (IRM) Work Plan (IRM Work Plan) for the portion of the Site that has been identified as Parcel A, and a Remedial Investigation (RI) Work Plan for the entire Site (Parcels A and B) was originally submitted to NYSDEC and the New York State Department of Health (NYSDOH) in January 2004, and was officially sent out for public review in March 2004. No comments were received by the public on the IRM Work Plan within the subsequent 30-day comment period. After suggested revisions by the Department, the Work Plan document was resubmitted on May 14, 2004, and was approved by NYSDEC on June 10, 2004.

The original BCA covered the entire 12-acre site. However, Atlas Park has now been separated into two distinct areas: Parcel A (formerly known as the "IRM Area" and, retained the original BCA site No.241045) and Parcel B (formerly known as the "RI Area"now designated BCA No. 241088). Parcel A (or the "Site") consists of an 8.474-acre portion of the 12-acre parcel (See Figure 2 for the Metes and Bounds). This RAWP addresses Parcel A only. With concurrence

from NYSDEC during a meeting on April 18, 2005, the Owner is proceeding with the administrative process to separate Parcels A and B into separate Brownfield Cleanup Agreements. The original BCA has been amended to reflect the IRM Area as Parcel A, and the RI Area as Parcel B. As noted above, the Amendment document is pending execution by NYSDEC.

A Final Engineering Report will be prepared to document the remedial measures implemented on Parcel A. The proposed remedial action activities will be consistent with the IRM Work Plan (approved by NYSDEC and NYSDOH in June 2004) and this RAWP for Parcel A. A separate Final Engineering Report will be prepared for Parcel B.

Proposed remedial action activities include excavation and major earthwork to remove impacted soil to varying depths up to approximately 15 feet below ground surface (bgs). This remedial work will prepare Parcel A for new construction of underground and above ground parking garage structures, foundations for two buildings with basement levels, storm-water detention basins, and utilities (See Figure 3 for the proposed development). The activities will also include excavation of soil for the sole purpose of remediation.

This RAWP will be implemented in conjunction with construction of the new development. The goal of implementing this RAWP is to remediate the Site to Track 1 cleanup standards for unrestricted future use. Until NYSDEC promulgates specific Track 1 cleanup levels pursuant to Section 27-1415 of the Brownfield Cleanup Law (Environmental Conservation Law Article 27, Title 14), we have been informed by NYSDEC the current Technical Administrative Guidance Memorandum (TAGM) 4046 Recommended Soil Cleanup Objectives (RSCOs) will serve as Track 1 objectives, and this RAWP has been developed based on this assumption. During the implementation of this RAWP, impacted soil exceeding TAGM 4046 RSCOs will be removed and disposed off the Site to achieve Track 1 objectives, and confirmatory post-excavation (endpoint and sidewall) soil sampling data will be collected to demonstrate that Track 1 objectives have been met.

1.1 ADJOINING PROPERTY DESCRIPTION

The areas surrounding the Site are zoned mixed residential and manufacturing (See Figure 4). The Site is located directly south of St. John's Cemetery. The area west of the Site is Atlas Park - Parcel B, which consists of former industrial use buildings undergoing renovation. Further west, the properties across 80th Street are predominantly zoned for light manufacturing, with some private residences. There is an industrial, triangular-shaped property to the south between the Site and the Long Island Rail Road (LIRR) easement; the areas immediately south of the LIRR easement are primarily residential. The remaining Atlas Terminals industrial site lies due east of Atlas Park; the area further to the east across 83rd Street is a mixture of residential and manufacturing properties.

1.2 SITE HISTORY

Historical Site uses have been compiled and are presented in a Phase I Environmental Site Assessment (Phase I ESA), completed by Ambient Group, Inc. (Ambient) in March 2001. The report was provided as an attachment in the BCP Application submitted on December 11, 2003 to NYSDEC. According to the report, in 1867, the Site was owned by the Folk family and consisted primarily of farmland. Based on a review of Sanborn maps as part of the Ambient report, several buildings occupied the Site prior to 1922, although their historical use is unknown. In 1922, the approximately 20-acre property was sold to the Hemmerdinger Corporation and the Site became known as Atlas Terminals. The Hemmerdinger Corporation leased portions of the Site to various manufacturing and processing companies from 1922 to the present See Figure 5 for an aerial view of the site prior to remedial activities.

In 2002, a 12-acre portion of the property was transferred to Atlas Park LLC with the intent to re-develop the 12-acre parcel into the proposed development known as The Shops at Atlas Park. The 12-acre parcel was subdivided into two distinct areas: Parcel A (8.474-acres), formerly known as the IRM Area and Parcel B (3.526-acres), formerly known as the RI Area . For the purpose of this RAWP, only those activities proposed for Parcel A will be discussed (see Figure 2). A separate RAWP will be developed for parcel B

1.3 SITE SETTING

1.3.1 Topography

The general Site topography slopes to the south-southeast, with a ground surface elevation ranging from approximately 93 feet above mean sea level (msl) in the northwest portion of the Site adjacent to Cooper Avenue, to approximately 72 feet above msl in the southern portion of the Site, adjacent to the LIRR easement. The surface topography is uniform.

1.3.2 Surface Water and Drainage

Ridgewood Reservoir, located within Highland Park approximately 1.4 miles southwest of the Site, is the closest surface water body to the Site. The Site is approximately 3 miles north of the headwaters of Spring Creek, which drains into Old Mill Creek and then into Jamaica Bay over 4 miles south of the Site. Willow Lake, located within Meadow Park, is approximately 2 miles northeast of the Site. Based on Site topography, the apparent surface water drainage is south/southeast towards the LIRR easement.

1.3.3 Geology

Regional Geology

Regional geologic conditions in this area of Queens generally consist of a thin layer of fill material overlying a wedge of unconsolidated sediment deposited during the Pleistocene and Cretaceous epochs on top of a bedrock basement. Bedrock outcrops in northwestern Queens County and dips to the southeast at a slope of approximately 80 feet per mile (Cartwright et al., 1998). Maximum thickness of the unconsolidated deposits range from 800 feet bgs in southeastern Kings County to greater than 1,100 feet bgs in southeastern Queens County.

The geology in the region is a product of multiple episodes of glaciation that took place during the Pleistocene epoch, approximately 20,000 years ago. Beneath a layer of fill material, the native sediment is composed of Pleistocene-age glacial outwash sand and

gravel that is described in Cadwell, 1989, as coarse to fine gravel with sand, proglacial fluvial deposition, well rounded and stratified. The Site abuts the southern edge of the terminal moraine, formed by sediment deposited by the leading edge of the glacier (Cadwell, 1989).

Below the Pleistocene deposits are a series of three hydrogeologic units deposited during the Cretaceous: Magothy Aquifer, Raritan Confining Unit, and Lloyd Aquifer. The Magothy Aquifer, which ranges in thickness from 0 to 500 feet (USGS, 1998), is approximately 100 feet thick beneath the Site (Smolensky et al., 1989). It is composed of fine to medium sand interbedded with lenses and layers of coarse sand and solid clay, and a layer of gravel at its base (Cartwright et al., 1998). Beneath the Magothy is the Raritan Confining Unit, a deltaic deposit composed of clay, silty clay, and clayey and silty fine sand. This unit ranges in thickness from 0 to 250 feet (Cartwright et al., 1998) and is approximately 150 to 200 feet thick beneath the Site (Smolensky et al., 1989). The Lloyd Aquifer, which underlies the Raritan Confining Unit, is composed of sediments of fluvial-deltaic in origin and consists of very fine to very coarse sand, gravel and interbedded clay and clayey and silty sand (Cartwright et al., 1998). This unit ranges in thickness from 0 to 300 feet (Cartwright et al., 1998) and is approximately 150 to 200 feet thick beneath the Site (Smolensky et al., 1989). A deep north-south trending paleochannel, eroded by the ancestral Hudson, is located east of the Site and cuts through all three of these Cretaceous deposits. This paleochannel was filled in by the Pleistocene deposits.

The Cretaceous deposits lie on top of bedrock, ranging from approximately 350 to 400 feet below the Site (Smolensky et al., 1989). The bedrock is defined as the Hartland Formation, which is comprised of interbedded granite, schist, and amphibolite.

Site Geology

Fifty-seven (57) soil borings were completed as part of the Parcel A and Parcel B investigations. Based on the lithology encountered, the Site is directly underlain by fill, followed by a native, glacial sand and gravel. The top layer of fill consists primarily of brown fine to coarse-grained sand with varying amounts of gravel, silt, rock fragments, construction debris, etc. The fill ranges in thickness from 0 feet, where the foundations of existing structures are bearing on soil, to about 16 feet. The average thickness of the fill is 5 feet.

The glacial outwash is composed predominantly of coarse- to fine-grained sand with varying amounts of clay, silt, and gravel. Cobbles and boulders are also present in areas. A silt layer was encountered in four borings (B-8, B-21, B-23, and B-42) at depths ranging from 4 feet to 13.5 feet below ground surface. The thickness of the silt ranged between 1.5 feet and 12 feet thick. With increasing depth, the outwash grades into a uniform, fine- to medium-grained sand.

1.3.4 Hydrogeology

Regional Hydrogeologic Conditions

The horizontal component of regional groundwater flow is to the south, with localized southwesterly flow components (USGS, 1997). The Pleistocene deposits constitute the Upper Glacial Aquifer where they are saturated with groundwater. The water table lies within the Upper Glacial Aquifer throughout most of Kings and Queens Counties. These outwash deposits, composed of outwash sand and gravel, are moderately to highly permeable with an average horizontal hydraulic conductivity of approximately 270 feet/day and anisotropy of 10:1 (Franke and McClymonds, 1972), thus vertical hydraulic conductivity of approximately 27 feet/day.

For some residents of southeastern Queens County, groundwater is utlilized for potable use. According to the New York City Department of Environmental Protection, public

water supply wells nearest to the Site are located approximately 1.9 miles to the southeast, situated downgradient of the Site along the estimated groundwater flow path. The closest public water supply wells to the Site are: 1) a well constructed in the Magothy Aquifer at 118th and Hillside Avenue in Kew Gardens Queens, approximately 1.9 miles southeast of Site, and 2) a well constructed in the Upper Glacial Aquifer at 11th Avenue and 126th Street in South Ozone Park, over 3 miles southeast of the Site.

Site Hydrogeologic Conditions

Based on water level measurements collected during the IRM Site Investigation, the depth to groundwater ranges from approximately 55 to 67 feet bgs and consequently, groundwater elevation ranges from approximately 14 to 15 feet Queens Borough President Datum (QBPD). Based on these measurements, the water table lies within the Upper Glacial Aquifer, and groundwater flow direction beneath the Site ranges from west-southwest to southwest. This groundwater flow direction is generally consistent with regional maps published by the U.S. Geological Survey. See Figure 6 for the groundwater contour map.

1.4 REMEDIAL ACTION OBJECTIVES (RAOS)

Remedial action objectives (RAOs) are goals developed for the protection of human health and the environment. Definition of these objectives requires an assessment of the constituents and media of concern, migration pathways, exposure routes, and potential receptors. The RAOs were developed based on the Qualitative Human Health Exposure Assessment prepared for the Site and included as Appendix A of this RAWP. Based on the findings of the IRM Site Investigation and the Qualitative Human Health Exposure Assessment, the RAOs of this RAWP include the following:

- Protect on-Site workers and the surrounding community from exposure to Site-related constituents during the planned remedial excavation and construction work that is part of the Site remedy.

- Establish guidelines for the proper management and disposal of soil, water, and other wastes generated during implementation of the proposed remedy.
- Achieve NYSDEC's Track 1 unrestricted use criteria (i.e., achieve TAGM RSCOs) such that, pursuant to Title 14 of Article 27 of the New York State Environmental Conservation Law, no institutional or engineering controls will be required.
- Provide facilities, integrated into the new construction, which will address potential future exposure of Site workers, employees, and visitors to soil vapors.

Remediation goals are based on standards, criteria, and guidelines (SCGs) to protect human health and the environment. The applicable SCGs are discussed in Section 2.2.

1.5 CERTIFICATIONS

A Professional Engineer registered in New York State, the Remediation Engineer (Langan), will provide certification in the final engineering report of the following:

- The remedy will be completed in substantial conformance with the NYSDEC-approved RI/IRM Workplan and this RAWP.
- Invasive work, excavation, soil loading, and grading will be conducted in accordance with approved dust suppression methodologies.
- Invasive work completed during the remediation and construction excavation (i.e. grading cuts, utility trenches, footings, etc.) will be performed in accordance with the field screening methodology outlined in this RAWP.
- Imported materials for backfill will meet the TAGM 4046 levels.
- Imported soil, including source approval and sampling, will be performed in a manner consistent with the methodology addressed in the Soil Management Plan.

1.6 PRE-IRM INVESTIGATIONS AND REMEDIATION

Various Areas of Concern (AOCs) were identified during the Phase I completed by Ambient, and were subsequently investigated during the IRM Site Investigation. See Table 1 for a

summary of AOCs and the related constituents of concern encountered at each. Figure 7 illustrates the location of the AOCs along with the IRM Site Investigation Sampling Plan.

The Owner submitted the IRM Site Investigation Report in April 2004. NYSDEC reviewed the Report and required the Owner to:

1. Investigate the locations of previous soil borings completed by others (pre-BCP) where volatile organic compounds (VOCs) were detected in soil (but below TAGM 4046 RSCOs),
2. Remediate any "hot spots" identified at the prior soil boring locations, to close out these areas and allow construction to proceed unimpeded, and
3. Screen soil below the existing buildings at the Site following demolition.

In response to NYSDEC's requirements, the potential "hot spots" were investigated and sub-slab screening was conducted during demolition. Results from these investigations were presented in the Pre-IRM Field Investigation Findings, IRM Status, and Proposed Addendum #2 to the IRM Work Plan, dated September 22, 2004 ("Pre-IRM Field Investigation Report").

Prior to implementation of the IRM Site Investigation activities, four underground storage tanks (USTs), and associated piping, were decommissioned and removed from the west side of former Building 16, and two USTs were removed from the east side of former Building 20. A tank closure report describing closure activities was prepared and submitted to NYSDEC Petroleum Bulk Storage (PBS) office and to the Department of Remediation on January 26, 2004. Due to the potential for collapse, demolition and removal of the tank vaults, bottom slab, and some remaining piping was postponed until after the buildings were demolished.

Following demolition of Building 16 in March 2004, the tank vault and additional remaining piping were removed, and endpoint soil samples were collected to demonstrate tank closure and compliance with Track 1 objectives. Documentation of this activity will be

provided in the Final Engineering Report, and in an addendum to the January 26, 2004 closure report.

During implementation of the approved RI and IRM Work Plans, soil, groundwater and soil vapor investigations were conducted on Parcel A and B (IRM and RI areas). The results and conclusions of the soil, groundwater, and one soil vapor investigation for Parcel A can be found in the IRM Site Investigation Report.

1.7 RAWP OBJECTIVES

This RAWP describes the remedial measures that will be implemented within Parcel A. The Site is being remediated under a Track 1 cleanup approach to unrestricted future use cleanup levels (currently TAGM 4046 RSCOs, pursuant to Section 27-1415 of the new Brownfield Cleanup Law (Environmental Conservation Law Article 27, Title 14). During implementation of the IRM Site Investigation, impacted ash and soil, which exceeds NYSDEC's TAGM 4046 RSCOs were uncovered. Impacted soil and ash will be removed as required, alleviating the need for institutional or engineering controls. Removal of impacted soil leaves no potential exposure risks to future occupants or users of the Site. As per the BCP requirements, one remedial alternative, impacted soil removal and off-Site disposal, was evaluated.

1.8 SUMMARY OF PROPOSED REMEDY

NYSDEC BCP guidelines require that only one remedial alternative be evaluated prior to selection of a remedy intended to meet Track 1 cleanup levels. The constituents of concern include some metals and semi-volatile organic compounds (SVOCs; see Qualitative Human Health Exposure Assessment, Appendix A. Consideration has been given to the presence of volatile organic compounds (VOCs) in the groundwater and soil vapor beneath the Site, as presented in the IRM Site Investigation Report. No on-Site source of VOCs was identified in the historic fill or soil at the site. Given the detected concentrations of individual VOCs are below the TAGM RSCOs, VOCs are not constituents of concern for the planned remedial activities.

To achieve Track 1 objectives there is only one feasible remedial solution for Parcel A. The proposed remedy includes excavation and off-Site disposal of ash, ash-impacted fill and other unanticipated impacted fill/soil exceeding TAGM 4046 RSCOs. The major excavation work covered under this RAWP includes excavation activities necessary for remediation and for preparing the Site for construction of underground parking garages, retail buildings, storm-water detention systems, and utilities.

Prior investigations indicated that the ash and ash-impacted fill was present within the shallow fill layer generally within 4 feet bgs but as deep as 7 feet bgs. During implementation of the proposed remedial activities, the impacted fill layer will be removed. Grading cuts and fills for Site development will not interfere or compromise the remediation of impacted areas at the Site. See Figure 8 for cut elevations of impacted soils based on the results of the IRM SI. Soil excavation will be conducted above the water table. Therefore, dewatering of soil prior to and during excavation activities will not be required.

After removal of the impacted fill layer, subsequent post-excavation (endpoint and sidewall) samples of the remaining soil left in place will be collected throughout the Site to demonstrate that the remaining soil meets Track 1 objectives. Endpoint and sidewall soil samples will be collected in accordance with this RAWP and NYSDEC Department of Environmental Remediation (DER) requirements, specifically DER-10. Soil samples were collected from soil borings during the IRM Site Investigation activities. Selected soil samples from these borings were collected from below the fill layer at the base of the proposed construction elevations. Based on laboratory analyses, the soil met Track 1 objectives. Therefore, with NYSDEC's concurrence these selected soil-boring samples will serve as "Track 1" endpoint samples in conjunction with *in-situ* post-excavation endpoint samples collected during the remedial activities. The results will be presented in the Final Engineering Report.

Impacted fill/soil removed during excavation will be disposed of in accordance with federal, state, and local regulations at permitted, approved disposal facilities.

2.0 ENGINEERING EVALUATION OF THE REMEDY

2.1 GENERAL

This section presents an analysis of a single remedial alternative for the proposed remedial activities as required by NYSDEC under the BCP for a Track 1 site. For a Track 1 site, only one remedy designed to meet Track 1 objectives needs to be evaluated. The proposed remedial activities for the Site include removal and off-Site disposal of ash, ash-impacted soil, and other impacted soil/fill that exceed TAGM 4046 RSCOs. Presented below is a technical description of the proposed remedy in accordance with the BCP statute and the DER-10 draft regulations.

2.2 TECHNICAL DESCRIPTION OF THE PROPOSED REMEDY

This Section presents a technical description of the proposed remedy. The components of the remedy are as follows:

- Segregate ash, ash-impacted soil, and other impacted soil/fill from apparent non-impacted soil/fill, using visual means, odors, and field monitoring with a photoionization detector (PID) during excavation for new subsurface structures and utilities. Staining, odors, and/or a positive PID response above background will designate a material as impacted.
- Dig and haul impacted soil/fill, or stockpile for waste characterization purposes, followed by off-Site transport and disposal.
- Characterize the stockpiled, apparently-impacted materials through lab testing and arrange for off-Site disposal at an approved facility.
- Characterize the stockpiled, apparent non-impacted soil through lab testing to determine its suitability for reuse on Site as backfill, need for off-Site disposal as a regulated waste, or removal from the Site as clean soil (if demonstrated to meet TAGM 4046).
- Excavate, characterize, and dispose as appropriate impacted ash/cinder-containing soils identified during the prior investigations at Parcel A (IRM Site Investigation), that are

located outside of the limits of the construction excavation, but within the entire Parcel A footprint in order to achieve track cleanup.

- Excavate, characterize, and dispose as appropriate ash/soil or other impacted materials that exceed TAGM 4046 RSCOs from within the Parcel A footprint, that are exposed on the sidewalls of the construction excavation once the intended limit of the excavation is reached.

2.3 ANALYSIS OF THE PROPOSED REMEDIAL ACTIVITIES

The main objective of the proposed Track 1 remedial alternative is to reduce the constituents of concern in soil in Parcel A to meet standards that will protect public health and the environment for an unrestricted use. The remedial program for the Site has been selected upon due consideration of the following factors listed in Section 27-1415 of the new BCP law (Article 27, Title 14 of the Environmental Conservation Law):

- Protection of human health and the environment;
- Compliance with SCGs;
- Short-term effectiveness and impacts;
- Long-term effectiveness and permanence;
- Reduction of toxicity, mobility, or volume of impacted material;
- Implementability;
- Cost effectiveness;
- Community Acceptance; and
- Land use.

Each of these factors is evaluated below relative to the proposed remedial alternative.

2.4 PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

This RAWP will be protective of human health and the environment since it is focused on physical removal of the historic fill and impacted soil End-point soil sampling will be

conducted to verify that impacted fill/soil exceeding TAGM 4046 RSCOs has been removed, and that remaining soil will not pose potential risks to human health or the environment.

Given the detections of VOCs in soil vapor and groundwater beneath the Site, as a pre-cautionary measure a sub-slab depressurization system (SSDS) will be installed beneath proposed Buildings 4 and 6 (See figures 9 and 10 for cross-sections through the proposed buildings). Details regarding the proposed usage of the buildings, particularly the lower floors, and the design of the sub-slab are being coordinated with NYSDOH. See Appendix A for the Qualitative Human Health Exposure Assessment for Parcel A.

2.5 COMPLIANCE WITH STANDARDS, CRITERIA, AND GUIDELINES (SCGS)

This RAWP is based on existing SCGs that are generally applicable, consistently applied, and officially promulgated. As noted throughout this RAWP, the remedy is based on existing guidance standards that have been traditionally applied to remediation sites with impacted fill and other relevant and appropriate technical guidance.

The following chemical, action, and location specific SCGs were identified for the Site and Site workers:

- NYSDEC Guidance on Determination of Soil Cleanup Objectives and Cleanup Levels – TAGM 4046, including December 2000 appendix;
- NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, Public Comment Draft, February 2005;
- New York State Groundwater Quality Standards – 6 Official Compilation of NY State Codes, Rules and Regulations (NYCRR) Part 703;
- NYSDEC Ambient Water Quality Standards and Guidance Values – TOGS 1.1.1, including unpublished limit of 10 ppb for methyl tertiary butyl ether (MTBE);
- OSHA General Industry Standards – 29 Code of Federal Regulations (CFR) Part 1910;
- OSHA Safety and Health Standards – 29 CFR Part 1926;
- OSHA Recordkeeping, Reporting, and Related Regulations – 29 CFR Part 1904;

- Resource Conservation and Recovery Act (RCRA) – Preparedness and Prevention – 40 CFR Part 264 Subpart C;
- RCRA – Contingency Plan and Emergency Procedures – 40 CFR Part 264 Subpart D;
- Identification and Listing of Hazardous Wastes – 40 CFR Part 261 and 6 NYCRR Part 371;
- NYS Waste Transporter Permits – NYCRR Part 364;
- NYS Solid Waste Management Requirements – 6 NYCRR Part 360 and Part 364;
- NYC Building Permit;
- New York State Department of Transportation (NYSDOT) Road Permits (if necessary); and
- Clean Water Act – 33 USC 466 Section 404.

The proposed remedial activities have and will continue to meet chemical SCGs. Although not a regulation, NYSDEC's TAGM 4046 RSCOs serve as current guidance for establishing unrestricted soil cleanup objectives. The RSCOs contained in TAGM 4046 are based on either reduction of potential human health risks (via exposure to soil) or protection of groundwater quality (via leaching and vertical migration of impacted material) for unrestricted use. The proposed remedial activities will meet the intent of TAGM 4046 by mitigating potential risks to human health and by protecting groundwater quality, through removal of fill/soil that exceed NYSDEC TAGM RSCOs.

During the remediation, the Site Contractors will be required to comply with applicable OSHA and RCRA health, safety, reporting, and contingency procedures; New York City permits procedures; NYSDOT road permit procedures; and procedures discussed below. Solid waste management requirements under 6 NYCRR Parts 360 and 364 will be followed for the:

- Soil excavation and storage at the point of generation;
- Transportation to the treatment facility or unit;
- Handling and storage prior to treatment at the facility;

- Management of treated materials.

A 6 NYCRR Part 364-permitted transporter will transport the excavated soil to the treatment/disposal facility.

2.6 SHORT-TERM EFFECTIVENESS AND IMPACTS

The remedy will be effective on a short-term basis because the sources are being removed. Potential short-term impacts would be associated with the remediation activities and increased vehicular traffic. Excavation and handling of soil may pose potential risks to on-Site workers through direct contact with impacted media, generation of nuisance odors and organic vapors, and risks associated with the depth of excavation. Excavation and handling of soil may pose risks to the surrounding community through generation of nuisance odors, dust, and organic vapors resulting from disturbance of soil and mobilization of impacted material off-Site by workers and vehicles. These risks will be managed during the remediation conducted at the Site. Other potential impacts to the community could include construction-related noise and construction-related vehicular traffic.

The time period for completing remedial excavation activities, hence occurrence of potential short-term impacts to workers and the community, will be dictated by the construction schedule, anticipated to be between 6 and 9 months but not to exceed 1 year. Potential short-term worker exposure to constituents of concern resulting from remediation activities would be mitigated through the proper selection and use of personal protective equipment (PPE), conducting air monitoring activities, and implementing engineering controls, if required (e.g., dust suppression, vapor suppression). Potential short-term exposure to the community would be mitigated through conducting air monitoring activities, implementing engineering controls (if required) and decontamination procedures to minimize the potential for off-Site migration of the constituents beyond Site perimeters, implementing appropriate security procedures, and maintaining a temporary fence to restrict unauthorized/uncontrolled access. Potential environmental impacts would be mitigated using engineering controls, such as erosion control procedures.

2.7 LONG-TERM EFFECTIVENESS AND PERMANENCE

The remedial program will achieve a complete, effective, and permanent cleanup of the Site because the source areas and impacted fill will be removed.

2.8 REDUCTION OF TOXICITY, MOBILITY, OR VOLUME OF IMPACTED MATERIAL

The remedial program will permanently and significantly reduce the toxicity, mobility, and/or volume of impacted material because the most preferable remedial technology will be applied, specifically the removal and off-Site disposal or treatment of the impacted material down to the level of un-impacted material as demonstrated by end-point samples

2.9 IMPLEMENTABILITY

The proposed remedy can be implemented based on the prior Site investigation information and pre-existing plans to excavate large portions of the Site during Site construction activities. The proposed remedial activities offer a technically feasible approach that can be implemented using available construction methods and professional remedial oversight. The proposed remedial activities can be implemented using standard construction equipment (hydraulic excavators). Construction methods for both remedial alternatives are developed and are not anticipated to require further technical development prior to implementation.

2.10 COST EFFECTIVENESS

The proposed remedy is cost effective because the project necessitates most of the planned excavation and because Parcel A is impacted and requires remediation.

Remedial costs are estimated to be $8,000.000. The total estimated remediation costs are predominantly associated with the characterization, transportation and disposal of impacted materials, and the premium on excavation costs for managing impacted materials, i.e., health and safety protocols, segregation, characterization, field oversight by environmental

contractors and consultants, and post-excavation (endpoint and sidewall) sampling to demonstrate that Track 1 objectives will be met. See Table 2 for an itemized cost estimate.

2.11 COMMUNITY ACCEPTANCE

The proposed remedy should be acceptable to the community because the Site will be remediated and redeveloped into an attractive commercial use with a "Green" recreational area for public access.

2.12 LAND USE

The following land use factors that were required to be analyzed in the BCP application materials are reproduced here. First, the current, intended, and reasonably anticipated future land use of the Site and its surroundings are compatible with the selected remedy of soil remediation. The proposed use is commercial, and this remedy is being designed to not only meet but also exceed cleanup levels appropriate for a commercial use. The reasonably anticipated future use of the Site and its surroundings has been documented by the applicant in the application, which led to the following conclusions:

- The use proposed for the Site conforms with applicable zoning laws or maps or the reasonably anticipated future use of the Site;
- The proposed use conforms to the current use and historical and/or recent development patterns in the area;
- The Site is located in an area that may be designated in the future as a Brownfield Opportunity Area pursuant to Section 970 of the general municipal law.
- While there are no applicable comprehensive community master plans for this portion of Queens, local officials are in favor of the project.
- The Site is located in a mixed commercial, industrial, and residential area, but the impacted material is not believed to be affecting any off-Site properties.
- There are no environmental justice concerns, since the proposed use will not cause or increase a disproportionate burden on the community in which the Site is located, and will not result in a disproportionate concentration of commercial or industrial uses in

what has historically been a mixed use community. This Site's use, which was formerly industrial, will now be improved into a commercial use with an interior park area for public access. Before this project, this Site was not accessible to the public.

- There are no federal or state land-use designations applicable to the Site.
- The proposed use is supported by population growth patterns and projections.
- The Site is accessible to existing infrastructure.
- The Site is not in close proximity to important cultural resources, including federal or state historic or heritage sites or Native American religious sites, natural resources, waterways, wildlife refuges, wetlands, or critical habitats of endangered or threatened species.
- The Site is not in close proximity to wellhead protection and groundwater recharge areas. We do not believe that the State has yet identified any other areas pursuant to its new state comprehensive groundwater remediation and protection program established pursuant to title 31 of article 15 of the Environmental Conservation Law.
- The Site is not in close proximity to floodplains.

A plan showing the land usage within ½ mile of the Site is presented in Figure 4. Sensitive receptors, such as schools and day care facilities are shown on this map.

2.13 CONCEPTUAL SOIL VAPOR DEPRESSURIZATION SYSTEM

As a pre-cautionary measure to address potential vapor intrusion, the Owner will install a sub-slab depressurization system (SSDS) beneath proposed Buildings 4 and 6 (See Figures 9 and 10 for cross-sections through the proposed buildings). The SSDS is not an engineering control affecting the Track 1 status of the Site. The SSDS design is provided in Appendix B.

3.0 DESCRIPTION OF REMEDIAL ACTIVITIES

3.1 GENERAL

This Section presents a description of the proposed remedial activities and methodologies

that will be implemented during the implementation of this RAWP at the Site. The following remedial action activities will be conducted:

- Excavation Contractor and, if required, Remedial Contractors procurement;
- Mobilization/Site preparation;
- Site security;
- Interim hot spot remediation preceding the remedial activities (e.g., UST vaults, transformer areas, and potential hazardous or petroleum hot spots).
- Soil excavation, soil management, stockpiling, off-Site transport and disposal;;
- Air monitoring;
- Equipment decontamination and residual waste management;
- Post-removal activities; and
- Demobilization.

A description of each of the remedial action activities is presented below. Remedial construction activities will be conducted from 7:30am to 3:30pm, Monday through Friday for the duration of the project. The appropriate provisions will be made with local governments to operate on weekends and holidays, should the need arise.

3.2 CONTRACTOR PROCUREMENT

With assistance from their Construction Manager, Plaza Construction Corp. (Plaza), and Remediation Engineer, Langan, Atlas Park LLC procured an Excavation Contractor, Earth Technology Inc, to implement the soil excavation work On behalf of Atlas Park, Langan will review contractor submittals required under the BCP project, provide independent oversight of the various contractors' activities, and document that the proposed remedial activities are completed in accordance with this RAWP and the required submittals documents (e.g., Site Operations Plan, or SOP). The Remediation Engineer will document that the contractor's remedial work conforms to the SOP and other final applicable Work Plans.

The specific tasks to be performed by involved contractors, subcontractors, and consultants related to remediation activities will be identified in the SOP. The Remediation Engineer will submit the required project documents to the NYSDEC, and the NYSDOH prior to mobilization to the Site and during the work (e.g., Site Operation Plan; Site-specific Health and Safety Plan; Community Air Monitoring Plan, and Stormwater Pollution Prevention Plan). Langan will review submittals required under this RAWP. The critical elements of the required project documents and plans are summarized below and in more detail in the Subsections of this RAWP. Sufficient detail is provided to allow NYSDEC and NYSDOH to approve this RAWP, with review of the contractor-prepared plans to be provided later, so the construction schedule can be met.

3.3 PRE-IRM SUBMITTALS

The Excavation Contractor, with the help and oversight of the Remediation Engineer, will prepare and submit detailed plans and other documents for submittal to NYSDEC and NYSDOH as required by the BCP agreement. However, these plans are not required to be approved by NYSDEC or NYSDOH. These submittals included the following:

- Site Operations Plan (SOP);
- Site Specific Health and Safety Plan (HASP; see Section 4.0);
- Community Air Monitoring Plan (CAMP; see Section 4.0);
- Construction Quality Assurance Plan (CQAP; see Section 5.0);
- Soil Management Plan (SMP; see Section 6.0);
- Stormwater Pollution Prevention Plan (see Section 7.0);
- Records/record drawings;
- Waste (soil and water) disposal information, including disposal facilities, testing requirements, permitting requirements, and pretreatment requirements, if necessary;
- Disposal transportation routes from the Site to the nearest major commercial roadway (Long Island Expressway) leading to the off-Site disposal facility(ies), description of containers and covers, modes of transportation, permitting requirements, and expected frequency and schedule of transportation; and

work on Site will prepare their own Site-specific HASP. Each Site-specific HASP must meet the minimum requirements established in the Site-specific HASP and 29 CFR 1910 and 1926. Each party will also agree in writing to abide by requirements set forth in the Site-specific HASP.

Community Air Monitoring Plan

This plan will provide the real-time air monitoring procedures for VOCs and particulates in accordance with the NYSDOH Generic Community Air Monitoring Plan (CAMP). The CAMP is further discussed in Section 4.0 of the RAWP.

Construction Quality Assurance Plan

The Remediation Engineer will prepare the CQAP, which will include the construction quality assurance/quality control (QA/QC) procedures for the remediation activities. The CQAP is further discussed in Section 6.0 of this RAWP.

Stormwater Pollution Prevention Plan

This plan will identify measures that may be implemented by the Excavation Contractor to minimize erosion and sedimentation during remediation activities. Measures will include physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soil. Soil stockpiling, dust control, maintenance, and removal procedures associated with erosion control measures will also be provided in this plan. The Erosion and Sedimentation Control Plan is further discussed in Section 7.0 of this RAWP.

3.4 MOBILIZATION/SITE PREPARATION

Prior to commencing the remedial activities under the IRM Work Plan, the Excavation Contractor will perform mobilization and Site preparation activities. The Remediation Engineer will oversee these activities. Descriptions of mobilization and Site preparation activities are provided below. The exact methods used by the Excavation Contractor will be specified in the SOP.

7.4 MAINTENANCE OF EROSION/SEDIMENTATION CONTROL MEASURES

The Contractor will install and maintain temporary erosion control measures. Silt fencing, inlet protection, and hay bale checks at catch basins installed on the Site shall be maintained as follows:

- The barrier and hay bale check condition shall be inspected once a week or after every storm event whichever comes first. Any necessary repairs shall be made immediately.
- Accumulated sediments shall be removed as required to maintain the barrier and hay bale check functional.
- Undercutting or erosion of the silt-fence toe anchor shall be repaired immediately with backfill materials (e.g., stone).
- Adhere to manufacturer's recommendations for replacing silt fence due to weathering.
- Areas used for Contractor storage of hazardous substances and materials (e.g., fuels) shall be lined with plastic and inspected regularly for any leakage of chemicals or fuels to the ground. Any such leakage will be rectified immediately upon discovery.
- Erosion and sediment control measures identified in the plan shall be observed to document that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters
- Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-Site sediment tracking
- The existing conditions of the adjacent City streets shall be maintained. If necessary, cleaning of the adjacent streets within 100 feet of the Site entrance/exit may be performed on an as needed basis as determined by the Remedial Engineer.

7.5 DUST SUPPRESSION

This Subsection presents a dust suppression plan to address dust management during invasive on-Site work. Monitoring of the construction activities for dust generation will be conducted by the Remedial Engineer and the Construction Manager's field inspectors.

Observation of visible dust will trigger additional dust control measures to mitigate the dust condition. Dust suppression will be achieved through the continuous use of a dedicated on-Site water truck equipped with a rear nozzle and water cannon to enable the spray of water into off-road areas including excavations and stockpiles. Preventative measures for dust generation will include construction of an engineered construction entrance, truck wash area(s), covering impacted and potentially impacted soil in the stockpile areas, and limiting vehicle speeds.

7.6 INSPECTIONS AND REPORTING

The Remediation Engineer will inspect the Site prior to commencement of construction to document that the appropriate erosion and sediment controls have been adequately installed or implemented to document overall preparedness of the Site for the commencement of construction. Following the commencement of construction, Site inspections shall be conducted by the Remediation Engineer at least once a week to:

- Inspect sediment control practices and record the approximate degree of sediment accumulation
- Inspect erosion and sediment control practices and record maintenance requirements such as verifying the integrity of silt fencing, truck wash areas, and containment systems (sediment traps/sumps).
- Identify any evidence of rill or gully erosion occurring on slopes. Document any excessive deposition of sediment or the accumulation of storm water along barrier or diversion systems.

The Remedial Engineer shall maintain a record of inspection reports in a logbook. The

logbook shall be maintained on Site and be made available to the permitting authority upon request.

8 SCHEDULE

Implementation of the proposed remedial activities is scheduled to begin in October 2004 and to last over the course of approximately one year, with all or at least the major excavation and backfill work to be completed within the first 12 months of construction. An IRM Site Investigation Report documenting the findings of the IRM Site Investigation was provided to NYSDEC and NYSDOH prior to commencement of the proposed remedial activities. A comprehensive schedule is provided in Figure 11.

9.0 REPORTING

9.1 REMEDIAL ACTIVITY PROGRESS REPORTS

Weekly reports by electronic media will be provided to NYSDEC's project manager during Site remediation and the remedial excavation activities, and monthly thereafter. Identification of impacted media identified by screening during invasive Site work will be promptly communicated to NYSDEC's project manager. Any spills or releases identified will be reported to the hotline and NYSDEC will be notified. These findings will be included in the weekly electronic media reports. Periodic reports, no less than one per week, will be required until the on-Site remediation is completed. A monthly progress report describing the activities conducted during the respective month as outlined in this RAWP will be submitted to the NYSDEC. The progress reports will include the following:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period;
- Description of approved activity modifications including changes of work scope and/or schedule;
- Sampling results received following internal data review and validation, as applicable; a

- Update of schedule including percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

A Site map with an alphanumeric excavation grid is included as Figure 12 . This map will be used to identify locations in communications to NYSDEC during Remedial Activities.

9.2 FINAL ENGINEERING REPORT

A Final Engineering Report and certification of completion will be submitted to NYSDEC following implementation of this RAWP. The Final Engineering Report will include:

- A description of the remedial actions performed;
- A description of the changes to the remedial design;
- Sampling and monitoring results;
- Accounting of the destination of material removed from the Site, including impacted soil that is excavated, historic fill and solid waste and fluids, and documentation associated with that disposal showing requisite approvals for receipt of the material.

A Professional Engineer registered in New York State, the Remediation Engineer (Langan), will provide certification of the remedial activities as outlined in Section 1.5 of this RAWP. This certification will be appropriately signed and stamped.

10.0 PROJECT ORGANIZATION

This Section presents the project organization and associated roles, including key personnel, descriptions of duties, and lines of authority for the implementation of this RAWP. Information regarding the organizations/personnel and their associated duties are provided below. An emergency contact list is provided in Table 3.

NYSDEC

NYSDEC, Region 2, will serve as the lead regulatory agency for this remediation. The NYSDEC project manager, Vadim Brevdo, P.E., and Region 2 Engineer, Daniel Walsh, Ph.D, will provide and coordinate regulatory oversight and direction. In addition, NYSDEC's counsel, Alali Tamuno will oversee the project.

NYSDOH

The NYSDOH will work closely with NYSDEC and will provide input from a health and safety perspective. The primary contacts for NYSDOH will be Dawn Hettrick, P.E., and Christopher Doroski.

Owner/Developer

As owner of the Site, Atlas Park LLC will implement the voluntary cleanup of the Site. General responsibilities of Atlas Park are set forth in the BCP agreement. To assist in the remediation implementation Atlas Park will contract a Construction Manager, Plaza Construction, and a Remediation Engineer, Langan Engineering & Environmental Services, P.C.

Remediation Engineer

The Remediation Engineer will coordinate the work of other contractors and subcontractors to Atlas Park for the services associated with the Site preparation, soil excavation, stockpiling, characterization, removal and disposal, air monitoring, emergency spill response services (if necessary), and management of waste transport and disposal. The Remediation Engineer selected by Atlas Park LLC for this project, Langan, will provide full-time engineering observation services for the duration of the remedial activities. The Remediation Engineer will document that the remedial activities are conducted in accordance with this RAWP, and that associated plans are submitted by the Construction Manager. The Remediation Engineer will certify that the remedial activities were completed in substantial conformance with the RAWP, and/or approved field changes. In addition to oversight and final engineering certification, the

Remediation Engineer may prepare and/or review pre-remedial plans such as the SOP, HASP, CAMP, CQAP, Erosion and Sedimentation Control Plan, and other appropriate plans.

Analytical Laboratory

A NYSDOH-certified laboratory will provide analytical services required for this project. The laboratory will be provided with the necessary information to complete the QAPP and will follow the procedures required in the QAPP.

Off-Site Disposal Facilities

Impacted materials that are excavated will be transported to and disposed of at licensed disposal facilities. Transportation to these facilities will be via legally permitted (such as permits required in NYCRR Part 364 and NYCRR Part 360) and NYSDEC-acceptable methods.

Non-impacted soil (soil not exceeding the NYSDEC TAGM 4046 RSCOs) and construction and demolition debris will be segregated from excavated materials and may be disposed of separately from excavated materials. Construction and demolition debris that is visually non-impacted per 6 NYCRR Part 360-7 will be taken to a licensed construction and demolition (C&D) facility.

The following mobilization/Site preparation activities will be conducted by the Excavation Contractor:

- Identifying the location of aboveground and underground utilities (e.g., power, gas, water, sewer, telephone, etc.), equipment, and structures (as necessary to implement the remediation);
- Mobilizing necessary remediation personnel, equipment, and materials to the Site;
- Clearing the areas that could obstruct/limit the soil excavation activities;
- Interim remediation of USTs, transformer pads, and potential solvent hot spots (See Section 3.6);
- Constructing a stabilized construction entrance consisting of a clean gravel roadway will be installed at or near the Site exit, which takes into consideration the Site setting and Site perimeter;
- Constructing materials staging area(s) for overall management and staging of suspected impacted material that is excavated, pending characterization testing. At a minimum, the staging area(s) will be bermed and lined with a 30-mil low-permeability liner that will slope to a collection sump. In addition, precautions to protect the integrity of the liner will be required such as the installation of a drainage/soil layer and/or geotextiles over the liners;
- Constructing an equipment decontamination pad for trucks, equipment, and personnel that come into contact with impacted materials during remedial activities. At a minimum, the decontamination pad will have a 30 mil low-permeability liner, be bermed and sloped to a collection sump to contain and collect fluids, and have side walls to mitigate, to the extent practicable, errant overspray, especially when decontaminating large equipment:

- Installing erosion and sedimentation control measures in accordance with the provisions of the Soil Erosion and Sediment Control Plan;
- Conducting pre-remedial activities including demolition of the existing buildings, building foundations, and other above-grade structures;

- Abandoning groundwater-monitoring wells located at the Site within buildings to be demolished and the areas of excavation. Monitoring wells that lie along the Site boundaries [B-1(OW), B-13(OW), B-12(OW) and B-56(OW)] will not be abandoned until concurrence from NYSDEC is obtained; and
- Installing and maintaining temporary fencing or other temporary barriers to limit unauthorized access to the areas where remediation activities will be conducted.

3.5 SITE SECURITY

Access to the Site will be restricted by perimeter fencing that will surround the work area. To further limit access and augment Site security during the remediation activities, additional measures will be required. These will include the following during performance of the project:

- Security at the Site (including the excavation, staging, handling, decontamination, and storage areas) will be maintained during both work and nonworking hours. The level of Site security will be dependent on the activities being performed and location of activities; however, the following security measures will be implemented: perimeter fencing, temporary fencing and/or barriers, warning tape, maintenance of sign-in/sign-out sheets, and implementation of safe work practices. Descriptions of Site security measures are provided below. The exact methods used by the Construction Manager will be specified in the SOP;
- Perimeter Fencing - At a minimum, the Site work area will be enclosed with a perimeter security fence, to control access for unauthorized personnel. Access gates will provide ingress and egress access to the Site. A perimeter fence will be installed around the remediation area consisting of an 8-foot high plywood fence, or equivalent;
- Temporary Fencing - The perimeter fence will be supplemented by temporary construction fencing as needed to identify and secure areas of the ongoing remediation activities. Such temporary fencing may be 4 feet high, and constructed of orange, high-density polyethylene (HDPE). At a minimum, the following areas will be subject to this requirement:

- Listing of governmental permits and authorizations required for Site remediation and development, and the name and contact information for governmental oversight of these permits and authorizations.

3.3.1 Site Operations Plan (SOP)

The SOP will provide detailed procedures for the Site operations and construction activities to be implemented for the completion of the remediation including the following:

- Work schedule;
- Site security;
- Mobilization and Site preparation;
- HASP, CAMP, CQAP, and other plan preparation;
- Traffic control;
- Excavation sequencing;
- Methods for material handling, including segregation of impacted soil from apparently non-impacted materials;
- Soil stockpiling/staging area development;
- Stockpiled soil characterization;
- Unanticipated subsurface obstructions;
- Waste handling and disposal;
- Off-Site waste/soil transportation plan;
- Disposal facility(ies);
- Coordination for foundation construction;
- Import and placement of select fill;
- Equipment decontamination and residual waste management; and
- Site demobilization.

Site Health and Safety Plan

The Remediation Engineer has prepared a Site-specific HASP for its personnel that covers the remediation efforts as set forth in Section 4.0 of this RAWP. Each party performing

- Areas where soil removal, stockpiling (if applicable), or loading for off-Site transport occurs;
- Areas designated as health and safety exclusion zones;
- Areas utilized for personal or equipment cleaning activities; and
- Why areas where the remediation activities may cause a disruption to the normal vehicular or pedestrian traffic.

- Posting of Warning Tape and Signs - Warning tape or sign may be installed at certain locations, such as open excavations, cleaning areas, and stockpile areas;
- Implementation of Safe Work Practices - Implementation of safe work practices will provide for additional Site security during remediation. Safe work practices that will contribute to overall Site security include the following:

  - Maintaining temporary construction fencing and signage around open excavations and other potentially dangerous areas;
  - Parking heavy equipment in a designated area each night and removing keys;
  - Maintaining an organized work area, including maintaining access roads, proper storage of tools and equipment;
  - Conducting a daily security review and health and safety meetings; and
    Maintaining covers on staging areas and associated sumps.

3.6 EXCAVATION, FIELD SCREENING, REMEDIATION, AND ENDPOINT SAMPLING

The following activities will be required as part of the soil excavation, subsurface screening, hot spot remediation and soil end-point sampling activities. The exact methods used will be specified in the SOP.

3.6.1 Soil Excavation and Stabilization

Soil Excavation Method and Approach

Soil will be excavated generally to depths of up to approximately 15 feet bgs, using conventional hydraulic excavation equipment. In areas where underground utilities, piping, or other structures are located, the soil excavation may be conducted by hand. Excavated soil is not expected to require dewatering. Soil may be loaded for direct transport off-Site or segregated into stockpiles for waste characterization testing, and either transported off-Site for disposal as regulated waste, reused on Site, or removed from the Site as excess, non-impacted soil (see Section 6.0, Soil Management Plan)

Sloping, Sheeting, and/or Shoring

It is anticipated that sloping of the excavation sides will be sufficient to maintain integrity of the excavation sidewalls, at least for the parking garage excavation. Sheeting and shoring may be required to protect adjacent buildings, roads, utility excavations or other structures. The specific methods of stabilizing excavation sidewalls will depend on several factors including the limits, depth, and configuration of the excavation area (relative to the surrounding grade); proximity to existing buildings; the nature of the subsurface materials; and other Site conditions. The design of the sheeting, shoring, or sloping methods required to support the excavations will comply with applicable state, federal, and local regulations, including but not limited to OSHA 29 CFR 1926 Subpart P, and will be developed by the excavation contractor. The sheeting and/or shoring may remain in place following soil excavation activities. Sloped areas along the foundation walls will be backfilled with suitable on-Site soil or imported, clean soil and compacted as required.

3.6.2 Subsurface Screening

This Subsection presents the procedures that will be used during field inspection and screening of soil during the proposed IRM remedial activities. Field screening will be completed during invasive work and following removal of existing buildings.

The Final Engineering Report will include a certification by a Professional Engineer that invasive work completed during the remediation and development (i.e. grading cuts, utility trenches, footings, etc.) was performed in accordance with this field screening methodology.

Screening During Building Demolition

Following removal of the existing building slabs during demolition, the Remediation Engineer will inspect the exposed sub-slab soil for visual evidence of impacts. In addition, the exposed soil will be screened for total organic vapors using a photoionization detector (PID) on an approximate 20 feet by 20 feet grid. At each grid node, a small diameter (0.25-0.5 inch) probe will be used to make a 6-10 inch hole below the soil surface. The PID probe will be inserted into the hole and positive readings above background levels will be recorded and staked. Any such areas identified will be better understood by completing additional probes at reduced grid spacing. The affected area will then be covered with plastic sheeting, anchored, and flagged with stakes and caution tape. Interim remediation and end-point soil sampling will subsequently be performed by a remedial contractor before the remedial excavation activities are completed in these areas, as described in Section 3.6.

Screening During the Remedial Excavation Activities

During removal of the impacted fill layer indicated on Figures contained within the IRM Site (Parcel A) Investigation Report, excavated soil will be continuously inspected for chemical or petroleum odors or staining, and field screened with a PID. The PID readings will be obtained either from soil contained within the excavator bucket and/or directly off the excavation sidewalls or bottom. The excavated material will be handled based on the results of this screening as described in the Soil Management and Reuse Plan (See Section 6.0).

If a hot spot is uncovered (materials other than ash and cinders registering PID readings above 5 ppm and/or visually impacted materials), the procedures for investigating and remediating a hot spot as described in Section 3.6.3 will then be implemented. Direct loading may resume once the hot spot is removed and end-point soil samples are collected.

As outlined in Section 6.0, the excavation plan calls for initially direct loading for off-Site disposal of the impacted fill layer (Category 1 material), followed some time later by excavation and either direct loading or stockpiling of the underlying presumed non-impacted soil (Category 3 material). As the impacted fill layer is removed, the bottom of the excavation will be inspected and field screened by the Remediation Engineer. Cleared areas will be identified on the Site map and in the field book relative to the Site grid as excavation proceeds and the inspection/screening is completed. At the discretion of the Remediation Engineer, subsequent PID screening during excavation of the deeper suspected Category 3 material may be curtailed in those areas that screen non-impacted of ash/cinders, other visible impacts, or volatile constituents.

3.6.3 Hot Spot Remediation

If a hot spot is uncovered during the remedial excavation activities, the impacted materials will be removed, characterized, and disposed in a controlled manner under direction of the Remediation Engineer. Test pits may first be excavated to attempt to determine the magnitude of the hot spot (i.e., one bucket, or a significantly larger volume). At the discretion of the Remediation Engineer, the excavation contractor may be allowed to remove the hot spot when the hot spot is limited in volume (not more than 5 truckloads) and depth (not more than 10 feet deep). In this case, the excavation contractor will excavate and load the impacted materials to trucks for transport to Stockpile 2. After removal of the hot spots, confirmatory endpoint samples will be collected at those locations.

If the impacted soil volume is estimated to exceed five truckloads and/or health and safety monitoring indicates that there is a potential for exposure of the contractor to impacted material or organic vapors, the remedial excavation activities will be diverted to another portion of the Site until the hot spot is evaluated by the Remediation Engineer. Appropiate remediation will be performed after consultation with NYSDEC and end-point samples will be collected post-remediation. The NYSDEC project manager will be notified. The area will be clearly marked in the field, e.g., with brightly colored construction barrels, to alert the excavation personnel not to approach the area until further notice from the Remediation Engineer. A remedial contractor will be mobilized to remediate the hot spot, as described above in Subsection 3.6.1 under the direction of the Remediation Engineer. In the interim, the affected area will be covered with plastic sheeting, anchored into place, until the remedial contractor mobilizes.

3.6.4 End-Point Soil Sampling

This Subsection presents the end-point soil-sampling plan for the final remedial excavation. End-point sampling for the localized areas including USTs, transformer pads, and hot spots is addressed in Section 3.6, and the results will be summarized in the Draft Final Engineering Report.

Bottom End-Point Sampling

During the IRM Site Investigation, extensive soil sampling for Site characterization was conducted throughout Parcel A. Samples were collected at several separate depth intervals. For the purposes of characterization and in order to document end-point conditions, thirty-nine (39) samples (1 from each boring) will be collected at the base of the completed remedial excavation. These samples were tested for the full list of regulated compounds required by NYSDEC, specifically, the TCL VOCs, SVOCs, and pesticides/herbicides, TAL metals, and PCBs. As per agreement with NYSDEC, these samples can partly satisfy the end-point soil sampling requirements for the remedial excavation, and will be supplemented with an additional fifteen (15)

post-excavation end-point soil samples to be collected from the base of the completed remedial excavation. The locations of the 15 supplemental samples will be biased towards discrete, localized sources of impacted material (i.e. concrete UST vaults, transformers, hot spots, etc.) or elevated detections from the IRM Site Investigation Report findings. Based on the IRM Site Investigation Report findings, five of the 15 end-point samples will be collected in the immediate vicinity of Boring numbers B-23, B-29, B-30, B-35, and B-41. If less than the 15 samples are necessary to cover the localized impacted source areas, the balance of samples will be distributed throughout Parcel A between previously sampled locations.

Sidewall End-Point Sampling

Sidewall samples will be collected upon reaching the limits of excavation within Parcel A. The general sampling frequency will be approximately every 100 feet. Samples will be biased to any apparent impacted materials that are visibly stained, odorous, or exhibit volatile emissions. Sample depths will generally coincide with the depth of the impacted fill removed from the particular area. On the south end of Parcel A and possibly other areas, sheet piling will be driven in advance of excavation. Therefore, it will not be possible to collect end-point soil samples from the excavation sidewalls in these areas. Instead, end-point samples will be collected from just outside the sheet piling using a Geoprobe, hand auger or other suitable collection method.

AOC End-Point Sample Analysis

Samples will be analyzed for an abbreviated parameter list, consisting of Site constituents of concern developed based on the findings of the IRM Site Investigation and the remedial excavation activities, and discussions with NYSDEC. The end-point sample results will be reviewed to determine if TAGM 4046 RSCOs are achieved, or if additional excavation of soil is required (within Parcel A only). Samples will be collected, handled, and analyzed as described in the Quality Assurance Project Plan (QAPP), which is provided in Appendix C.

3.6.5 SPILL REPORTING AND CLOSURE

Should a spill occur on the Site, the Remediation Engineer will inform the NYSDEC within two hours of the incident. A spill number will be obtained, and the spill number, volume, material type, and date and time of the spill will be recorded. Every attempt will be made to safely contain the spill. Examples of spills are listed below.

- Breached containment vessel encountered during excavation (UST, Drums, leaking sub-surface pipe, etc.) resulting in impacts to surrounding soils – minimum of 5 gallons
- Free-floating product identified on the Site
- A spill resulting from fueling of on-Site equipment, servicing equipment (oil change, lubrication, etc.) – minimum of 5 gallons

3.6.6 AIR MONITORING

An air-monitoring program will be implemented during Site remediation activities to protect the health and safety of Site workers and the surrounding community, and address potential nuisance odors. This effort will include both work areas and perimeter air monitoring programs. The on-Site air-monitoring program is presented in the Site-specific HASP and the perimeter air-monitoring program is presented in the CAMP. These documents contain odor/vapor and dust monitoring and control action levels. The results of the CAMP monitoring data will be provided in the Final Engineering Report. Odor/vapor and dust control measures will be initiated if action levels are exceeded. The methods to control odors and/or vapors during remediation activities were specified in the SOP.

The work area/breathing zone air monitoring program will be implemented by employing direct-reading survey instruments to identify the appropriate level of

PPE needed based on total organic vapor and particulate concentrations. The perimeter and interiors of the excavations will be monitored for total organic vapors and total particulates.

An air-monitoring program will be established that will consist of air-monitoring stations at the perimeter of the Site. Perimeter monitoring will include use of hand held direct-reading survey instruments for total organic vapors and dedicated direct-reading survey instruments for particulate monitoring at each perimeter air monitoring sample station.

Action levels will be established for the worker area/breathing zone and perimeter air-monitoring program to determine if health and safety protocols or construction technique modifications need to be performed to reduce odor/vapor or dust emissions from the Site.

3.7 EQUIPMENT DECONTAMINATION AND WASTE MANAGEMENT

3.7.1 Equipment Decontamination

Equipment cleaning will be utilized to prevent the transport of waste materials that may be present on the equipment used for remediation activities (e.g., excavators, loaders). The Excavation Contractor will select and the Remediation Engineer will approve the methods and approach (as part of the SOP) for equipment decontamination activities. Specific equipment cleaning procedures will be required, at a minimum, to include the following:

- Each transport vehicle will be visually inspected before leaving the loading area. Accumulations of soil on the vehicle tires or other exterior surfaces will be removed manually or, if necessary, by using a high-pressure water and/or steam spray in the equipment cleaning area.

- Material handling equipment that has come into contact with waste-containing soil will be cleaned in the equipment cleaning area before it enters non-work areas, handles "non-impacted" materials (e.g., backfill), or leaves the Site. Equipment cleaning will likely be performed manually, utilizing a high-pressure water spray, and/or steam cleaning.
- Liquid materials, such as decontamination water and other residual material collected during equipment decontamination will be collected and containerized for off-Site disposal and/or discharged to the sewer system.
- A visual inspection of heavy equipment (e.g., excavators, loaders) will be performed following final equipment cleaning. If the visual inspection indicates waste materials remain, the equipment will be cleaned and inspected as many times as necessary.

3.7.2 Liquid Wastes

As part of the SOP, the Excavation Contractor, with the Remediation Engineer's approval, will select the methods and approach for handling and disposition of water generated during the remedial activities. The Excavation Contractor will be required to obtain and comply with applicable permits required for disposition of wastewater generated during the remedial activities. Since groundwater is well below excavation depth for the sub grade garage, dewatering of groundwater will not be necessary. Water generated from the remediation activities either will be pretreated on Site and discharged to the New York City Department of Environmental Protection's (NYCDEP's) sewer system in accordance with applicable permits, or be collected for off-Site disposition in accordance with applicable federal, state, and local regulations. Water samples collected in accordance with the discharge permit requirements will be submitted to a NYSDOH ELAP-approved laboratory for analysis.

3.7.3 Miscellaneous Wastes

Miscellaneous waste generated during the remediation activities may be classified as general refuse or investigation- and remediation-related waste material.

General refuse, i.e., material that has not contacted any impacted Site media, including, but not limited to, used disposable equipment, perimeter and temporary fencing will be managed as a non hazardous waste and disposed of at a non hazardous solid waste disposal facility.

Remediation-related equipment and materials that come in contact with impacted Site materials will be considered impacted. This material may include, but not be limited to, used disposable equipment, PPE, sampling equipment, cleaning residuals, materials used to construct the materials handling areas, decontamination pads, and PPE. These materials will be containerized as generated and staged for subsequent disposal by the Excavation Contractor in accordance with federal, state, and local requirements. Characterization samples collected will be submitted to an ELAP-approved laboratory for analysis if required

3.7.4 Unanticipated Subsurface Obstructions/Conditions

Unanticipated subsurface obstructions such as old piles, large pieces of demolition debris, and USTs will be handled in accordance with any applicable federal, state, and local ordinances and regulations.

Old Piles and Demolition Debris

Unanticipated old piles and demolition debris within the excavation area will be processed (cut or broken) into lengths or pieces suitable for off-Site disposition in accordance with the selected disposal facilities requirements. If this

construction and demolition (C&D) debris is not visually impacted, such debris will be disposed at a licensed C&D disposal facility. Otherwise, the materials will be processed to meet the requirements of the receiving disposal facility.

Underground Storage Tanks

USTs encountered in the confines of the excavation will be handled in accordance with NYSDEC STARS Memo #1 Petroleum-Contaminated Soil and Guidance Policy requirements. Any separate phase petroleum encountered in soil at or near the bottom of the excavation will be handled in accordance with NYSDEC STARS Memo #1 Petroleum-Contaminated Soil and Guidance Policy requirements. Any suspect chemical USTs uncovered will be handled similarly with the contents and any impacted soil tested for an appropriate suite of chemicals to identify the tank contents and the required removal/disposal procedures.

3.8 POST-REMOVAL ACTIVITIES

Following soil excavation activities, the foundations will be constructed, utilities will be laid, and excavation will be backfilled with on-Site soil/fill determined to comply with TAGM 4046 RSCOs, or imported select fill. Imported clean fill and soil to be used for open soil cover will meet requirements of TAGM 4046. Soil cover material will be suitable to sustain vegetation.

3.9 DEMOBILIZATION

The Excavation Contractor shall demobilize labor, equipment, and materials not designated for off-Site disposal from the Site. The Remediation Engineer will document that the Excavation Contractor decontaminates (in accordance with the SOP) equipment and materials prior to removal from the Site.

The Remediation Engineer will document that the Excavation Contractor perform any follow-up coordination and maintenance activities listed below.

- Restoring areas disturbed to accommodate support areas (e.g., staging areas, decontamination areas, storage areas, temporary water management area[s], access area), and any other areas identified by Atlas Park;
- Removing any temporary access areas (whether on Site or off Site) and restoring the disturbed access areas to pre-remediation conditions as determined by Atlas Park; and
- Removing sediment and erosion control measures and disposing of the materials in accordance with acceptable rules and regulations as a non-hazardous waste.

4.0 HEALTH AND SAFETY PLANS

This Section presents the health and safety plan for establishing safe working conditions at the Site and protection for the community. This HASP is presented in Appendix D.

Site-Specific Health and Safety Plan

The Remediation Engineer will prepare the Site-specific HASP. It will apply to work performed until impacted materials are removed from the Site and excavation and grading work is completed, including invasive work under remediation and Site development (including Site grading and materials relocation. It will provide a mechanism for establishing safe working conditions at the Site, where safety organization, procedures, and PPE requirements will be established based on an analysis of potential Site-related hazards. The Site-specific HASP, at a minimum, will meet the requirements of 29 CFR 1910 and 29 CFR 1926 (which includes 29 CFR 1910.120 and 29 CFR 1926.65). The HASP will include, but will not be limited to, the components described below.

- Identification of Key Personnel - Identification of the on-Site and off-Site health and safety personnel for monitoring and documenting proper health and safety procedures, including the resume of the Site Safety Coordinator. On-Site personnel directly involved with excavation and removal of USTs and any associated impacted soil, or other significantly impacted materials uncovered (but not the ash material) will

be required to maintain OSHA 40-hour hazardous waste training (29 CFR 1910.120 and 29 CFR 1926.65) and the corresponding 8-hour refresher course update. Excavation and soil handling activities will be supervised by staff with the above training and certifications.

- Training - A description of health and safety training requirements for supervisory and on-Site personnel will be presented. Training requirements will include attending an initial Site orientation prior to engaging in any on-Site activities.
- Medical Surveillance - A description of appropriate medical examinations required for supervisory and on-Site personnel to conduct the tasks associated with the performance of the remedy will be presented. Associated tasks may include the following: working with chemicals, heavy lifting, using respiratory protection, using PPE and conducting hazardous substance operations in accordance with 29 CFR 1910.120 and 1926.65.
- Site Hazards - A description of chemical and physical hazards associated with the Site will be presented in the HASP. In addition, a discussion of identifying and mitigating foreseeable chemical and physical hazards associated with the work will be presented. Foreseeable chemical and physical hazards may include, but will not be limited to, hazards associated with exposure to constituents of concern, heavy equipment operation, Site conditions, weather, biological hazards, materials handling, and work around excavated areas and water.
- Work Zones - A description of the work zones that will be established during the remedy will be presented. The work zones will be identified on a Site plan that depicts the designation of zones including: (1) Exclusion Zones; (2) Contamination Reduction Zones; and (3) Support Zones. The level of personal protection required for each work zone will be specified.
- Personal Safety Equipment and Protective Clothing - The HASP will identify personal safety equipment and protective clothing to be used and available on Site. This will include identification of expected levels of protection for the work, and the action levels for personal protective equipment upgrades. Also included will be a respiratory

protection program that meets the requirements of 29 CFR 1910.134, which establishes specific requirements for any respirator use.

- Air Monitoring Plan - An air-monitoring plan that identifies air-monitoring requirements on Site and at the Site perimeter for Site-specific constituents of concern. The air-monitoring plan may contain requirements for personnel monitoring and will trigger concentrations for Site-specific constituents of concern that will require corrective action.
- Equipment Cleaning - The methods and procedures for decontamination of personnel, vehicles, and equipment will be described.
- Confined Space Entry - The HASP will describe procedures for confined space entry in accordance with OSHA's Permit-Required Confined Space Standard (29 CFR 1910.146). In addition, requirements for Confined Space Entry Training for authorized personnel in accordance with 29 CFR 1910.146 will be presented.
- Material Safety Data Sheets - Material Safety Data Sheets (MSDSs) for materials to be brought on Site, as well as constituents that will be encountered in the course of remediation will be presented as an attachment or appendix to the HASP.
- Excavation Safety - Excavation and trenching safety procedures as specified in 29 CFR 1926 Subpart P including, but not limited to soil classification, excavation inspections, protective systems, and designated competent persons, will be discussed.
- Procedures and Programs - Standard operating procedures and safety programs as required by applicable sections of Section 1910 of 29 CFR 1910 and 29 CFR 1926.
- Contingency Plan - The HASP will also contain a contingency plan to be implemented in the event of various emergency or non-routine events. The contingency plan will set forth procedures for addressing spill prevention and emergency response procedures, odor control, emergency vehicular access/egress, evacuation, emergency notification and contacts, and emergency medical procedures.

Community Air Monitoring Plan

The CAMP provides monitoring and protection for the community not directly involved in the remediation activities from organic vapors and dust, and was prepared in

conformance with NYSDEC/NYSDOH requirements. The CAMP was included in Section 3.3.2 of the RI Site (Parcel A) Remedial Investigation Work Plan, and it is provided in the Health and Safety Plan in Appendix D. The CAMP addresses:

- Identification of potential off-Site receptors adjacent to the remediation Site.
- Location of perimeter sampling stations.
- Real time perimeter VOC monitoring field methods.
- Real time perimeter particulate monitoring field methods.
- Laboratory analytical methods for personnel and confirmation samples.
- VOC and particulate action levels.
- Contingency procedures if action levels are exceeded.
- Documentation procedures.
- Field quality control procedures.
- Laboratory quality control procedures.

5.0 CONSTRUCTION QUALITY ASSURANCE PLAN

This Section presents the quality assurance/quality control procedures for documenting that the remediation activities are conducted in general conformance with this RAWP.

The Remediation Engineer will prepare a CQAP that will describe the Site-specific components of construction quality to provide for remedy construction that meets the remediation objectives and specifications. The CQAP will include a program for construction observation and testing to assess whether the remedy construction is performed in accordance with the design specifications. The CQAP will include the following components described below.

- Duties and authorities of the organizations and key personnel involved in the design and construction of the remedy.
- The qualifications of the quality assurance personnel who demonstrate that they possess the training and experience necessary to fulfill project-specific duties.

- The observations and tests used to monitor construction and the frequency of performance of these activities.
- The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for implementing corrective measures as addressed in the plans and specifications.
- Requirements for project coordination meetings between Atlas Park and its representatives, the Construction Manager, Excavation Contractor, remedial or environmental subcontractors, and other involved parties.
- Description of the reporting requirements for quality assurance activities including such items as daily summary reports, schedule of data submissions, inspection data sheets, problem identification and corrective measures reports, evaluation reports, acceptance reports, and final documentation.
- Description of the final documentation retention provisions.

The CQAP will provide a detailed description of the observation activities that will be used to monitor construction quality and confirm that remedy construction is in conformance with the remediation objectives and specifications.

6.0 SOIL MANAGEMENT AND REUSE PLAN

6.1 SOIL MANAGEMENT AND DISPOSAL STRATEGY

This Section presents the approach to managing, disposing, and reusing soil, fill, and debris excavated from the Parcel A. This plan is based on our current knowledge of Site conditions, and will be augmented with the data collected during the IRM Site Investigation. Langan will monitor and document the handling and transporting of material as a regulated waste or as an unregulated waste, off of the Site to an appropiate disposal facility. Langan will assist the Remedial Contractor in identifying impacted materials during excavation, determining materials suitable for direct load out versus temporary on-Site stockpiling, selection of samples for waste characterization, and determining the proper off-Site disposal facility. Three separate Stockpile Areas will be constructed for the various materials to be excavated,

with the intent to most efficiently manage and characterize the materials and to avoid co-mingling impacted materials with non-impacted soil.

In general, there are three major categories of material to be excavated:

- Category 1 - Impacted Fill – Portions of the shallow on-Site fill have been determined to be above the NYSDEC TAGM 4046 RSCOs, based on extensive prior field sampling by others and during the most recent IRM Site Investigation (defined hereafter as Category 1 material, or "Impacted Fill"). In most cases, the impacted fill is associated with ash and cinders, mixed in with the sand fill or present as thin layers (less than 2" thick). The current estimated thickness and extent of this impacted fill layer based on the field data were presented on Figures 4A and 4B in the IRM Site (Parcel A) Remedial Investigation Report. The actual extent will be determined during the remedial excavation activities.

  It is anticipated that a disposal facility or facilities will be identified that will agree to accept the impacted fill based on the existing soil testing data. In this case, the general procedure for managing the impacted fill layer will be to excavate and load out directly to trucks for transport to a permitted landfill, RCRA Treatment, Storage, and Disposal Facility (TSDF), or a approved beneficial reuse, such as interim landfill capping material, recycling into asphalt, etc.Alternatively, these materials may be temporarily stockpiled in Stockpile Area 1, pending scheduling of trucks, additional waste characterization required by the facility, or other reasons preventing the direct loading of the waste for off-Site transport. The material will then be loaded, manifested, transported, and disposed at the approved facility(ies).

  During excavation, this material will be inspected and field screened with a PID for any evidence of impacts other than ash or cinders. Should any such other impacts be identified with a PID or through visual inspection, this material will be considered Category 2 material and will be handled accordingly (see below). Mechanical processing of the historic fill will not be performed.

- Category 2 - Other Impacted Soil/Fill – During the remedial excavation activities, localized impacts may be uncovered that cannot be identified as Category 1-Impacted Fill or Category 3-Non-Impacted Fill/Soil (see below). This material will be excavated and transported to Stockpile Area 2 for characterization and waste classification, followed by loading, transporting, and disposing at an approved facility based on analytical results. Stockpiles of this material will generally not exceed 1000 cubic yards for proper characterization.
- Category 3 - Non-Impacted Fill/Soil – There are portions of the on-Site fill as well as the underlying native soil to be excavated that are non-impacted (do not contain ash/cinders and comply with TAGM 4046 RSCOs) or contain only *de minimis* concentrations of non-critical, naturally-occurring regulated compounds that may exceed TAGM 4046 RSCOs, for example, magnesium, calcium, nickel, iron, aluminum, and zinc. Based on field inspection, confirmatory analytical testing, and NYSDEC approval, these materials may be reused on Site or transported off Site to be reused or disposed at the Excavation Contractor's discretion. The Remediation Engineer will review and reach agreement on the Contractor's proposed disposal site(s).

  The first test for identifying Category 3 material will be field inspection and screening, i.e., no visible ash/cinders, staining, petroleum/chemical odors or PID readings above background levels are observed. In this case, the material, if proposed to be reused on Site, will be transported to Stockpile Area 3 for confirmatory testing for the NYSDEC TAGM parameter list of analytes. If no TAGM 4046 RSCOs are exceeded, or if only exceedances of non-critical, naturally-occurring compounds at *de minimis* concentrations are reported) and contains no solid waste, it may be reused on Site. If the material will be transported off Site, the contractor will have the option of characterizing the material *in-situ* via methods approved by NYSDEC, e.g., test pits, soil borings, etc., or by stockpiling and testing. If the material does not exceed any TAGM 4046 RSCOs and if it contains no solid waste, it may be transported off Site at the Contractor's discretion. If the material is characterized *in-situ* it may be directly loaded to trucks for off-Site transport.

If this material exceeds TAGM 4046 RSCOs (other than the non-critical compounds listed previously), it will be transported to and disposed at an approved landfill, RCRA TSDF or another approved beneficial reuse facility. We do not expect that any such disposal facilitiy(ies) will need further waste characterization testing besides the TAGM parameter list of analytes, although additional required testing will be completed if necessary.

Additional Stockpile Areas may be constructed as needed. For example, if suspected hazardous wastes or toxic wastes (PCBs present) are uncovered during Site excavation, a fourth Stockpile Area could be constructed to segregate these suspect materials from the other stockpiled soil. Because these conditions are not anticipated, and if they do occur, would only be expected to involve *de minimis* quantities, construction will be completed only if needed.

The proposed disposal facility(ies) and/or reuse site(s) will be reviewed and approved by Langan before any materials leave the Site. In order for there to be a smooth flow of materials from the Site, minimize the overall length of time required for trucking materials, and prevent the need to queue trucks on public roadways, the NYSDEC, in conjunction with Atlas Park LLC, shall have the discretion to modify the specific procedures of this Soil Management and Reuse Plan, specifically related to waste characterization procedures (i.e., sampling *in-situ* versus stockpiled materials) and the selection of the end use/disposal options for materials to be removed from the Site.

The following Subsections describe the more specific related procedures to be used including construction/maintenance of stockpile areas; waste characterization; load out, transport and disposal; soil reuse; and import of soil fill (if required).

6.2 CONSTRUCTION OF SITE ENTRANCE/EXIT AND TRUCK WASH AREA

One or more stabilized Site entrances/exits will be constructed, tentatively to be located off Cooper Avenue, consisting of a clean gravel roadway.

An engineered truck wash/decontamination pad will be constructed on the Site adjacent to the Site exit(s) along the egress path of vehicles. Power washing of truck tires, undercarriages, etc. will be completed for trucks and equipment departing the Site, from the start of excavation work until impacted soil has been removed from the Site. At a minimum, the decontamination pad will have a 30-mil low-permeability liner, be bermed and sloped to a collection sump to contain and collect fluids, and have sidewalls to mitigate, to the extent practicable, errant overspray, especially when decontaminating large equipment. Wash waters will be collected and properly disposed off-Site or to the New York City combined or sanitary sewer system. The collected rinse waters will pass through a sedimentation tank, and the sediment will be handled and disposed separately from the liquid portion.

Erosion and sedimentation control measures will be constructed in this area, among other areas, in accordance with the provisions of the Soil Erosion and Stormwater Pollution Prevention Plan (Section 7.0).

6.3 TRUCK TRAFFIC CONTROL

The proposed truck route to and from the Site from the nearest major highway (Long Island Expressway) is shown in Figure 4. This travel route from the Site was selected considering:

(a) limiting transport through residential areas,

(b) use of known truck routes,

(c) limiting the total distance to the Long Island Expressway, and

(d) safety in access to highways.

The Excavation Contractor will submit to the Construction Manager and Langan detailed plans showing the transportation routes that will be used to each facility prior to transport.

Atlas Park LLC will make every effort not to queue trucks off-Site, by maximizing the amount of interior Site roadways and truck parking areas, and scheduling/sequencing the excavation work. However, given the volume of soil to be removed and the aggressive development schedule, there may be times when off-Site queuing is necessary to provide a safe and expeditious off-Site movement of soil. If so, we anticipate queuing would only be required along 80th Street, which is a non-residential area. Atlas Park LLC is working with New York City Department of Transportation to enable rapid installation of the approved traffic lights on Cooper Avenue to facilitate truck entry to and exit from the Site.

Egress points for truck and equipment transport from the Site will be properly maintained (clean of dirt and other materials) during Site remediation and development, and trucks exiting the Site will be securely covered.

6.4 CONSTRUCTION OF SOIL STOCKPILE AREAS

Soil stockpile areas will be constructed for staging of impacted soil, suspected impacted soil, and presumed non-impacted soil, pending loading or characterization testing. It is anticipated that three separate Stockpile Areas (1, 2, and 3) will be constructed for the various categories of excavated materials, to most efficiently manage, control, and avoid co-mingling impacted and non-impacted materials. Stockpile areas will meet the following minimum requirements:

- The excavated soil will be placed onto double layers of a minimum 8-mil low-permeability liner of sufficient strength and thickness to prevent puncture during use.
- Equipment and procedures will be used to place and remove the soil that will minimize the potential to jeopardize the integrity of the liner.
- Stockpiles will be covered at the designated times (see below) with minimum 8-mil plastic sheeting or tarps which will be securely anchored to the ground. Stockpiles will be routinely inspected and broken sheeting covers will be promptly replaced.

- Stockpiles will be covered upon reaching their capacity of approximately 2,000 cubic yards until ready for loading. Stockpiles that have not reached their capacity will be covered at the end of each workday.
- Active stockpiles will be covered at the end of each workday.
- Each stockpile area will be encircled with silt fences and hay bales, as needed to contain and filter particulates from any rainwater that has drained off the soil, and to mitigate the potential for surface water run-on.
- The stockpile areas will be sloped wherever possible and equipped with a sump to collect any rainwater that has drained off the stockpiled soil. Drained water will be removed from the sump, as required, and handled in accordance with Section 3.8;
- The stockpile areas will be inspected daily and noted deficiencies will be promptly addressed.

Within each stockpile area, the excavation contractor will stockpile the soil in separate piles, each of which will not exceed 2,000 cubic yards. Each pile will be staked and labeled with a number to coincide with labeling on the associated sample container for proper correlation of the analytical results to the pile.

6.5 WASTE CHARACTERIZATION

The various categories of materials that will be characterized on the Site were described in Section 6.1. It is anticipated that a disposal facility or facilities will be identified that will agree to accept the Category 1-Impacted Fill based on the existing soil testing data. Otherwise, appropriate waste characterization testing will be performed to satisfy the facility(ies). This waste characterization may be performed *in-situ* via test pits or other NYSDEC-approved methods, or from stockpiled material (Stockpile 1). Category 2-Other Impacted Soil/Fill will be stockpiled and tested in accordance with the facility's stockpile sampling requirements (Stockpile 2).

It is anticipated that Category 3-Non-Impacted Fill/Soil will be accepted by the facility(ies) based on TAGM 4046 RSCO exceedances. Otherwise, appropriate waste characterization

data will be collected *in-situ* or from stockpiled material (Stockpile 3). The Contractor will provide the appropriate permits, certifications, and written commitments from disposal facilities to accept the material throughout the life of the contract. Submittals will be reviewed by Langan and submitted to the NYSDEC as required. Langan will provide direction in the field to the Contractor for identification of impacted materials during excavation, and for selection of samples for the purpose of waste characterization.

Commitment letters will be supplied on the facility's letterhead, and include the Atlas Park Site as the originating Site, the specific analytical data provided to and reviewed by the facility, a statement that the facility is in compliance with its permit, any restrictions on delivery schedules or other conditions that may cause rejection of transported materials, and the accepted daily quantities of soil that may be disposed.

Soil stockpile sampling frequencies and methods (e.g., grab versus composite sampling) will conform to the facility's requirements.

Laboratory tests for characterization of a waste stream typically include all parameters or a subset of the following list. The actual testing will be determined by the facility's permit requirements.

- Total petroleum hydrocarbons (TPH) by gas chromatograph/ photoionization device (GC/PID);
- Total VOCs, Method 8260;
- Total SVOCs, Method 8270;
- Total PCBs, Method 8082;
- Total metals (14), Method 6010B;
- Ignitability, corrosivity, and reactivity;
- Toxicity Characteristic Leaching Procedure (TCLP) VOCs, SVOCs, metals and pesticides and herbicides; and
- Diesel Range Organics (DRO) and Gasoline Range Organics (GRO).

Characterization samples collected will be submitted to an ELAP-approved laboratory for analysis. Analytical reports will be maintained and copies will be available for inspection in the field and will be included in the Final Engineering Report. Appropriate field and laboratory QA procedures (e.g., sample shipment and custody) will be maintained, as outlined in the QAPP, with the exception that field duplicate, rinse blank, and matrix spike/matrix spike duplicate samples will not be collected for waste characterization samples. Samples will be collected using disposable sampling tools into clean, laboratory-supplied glassware. Sampling personnel will don the appropriate PPE as per the HASP.

6.6 LOAD OUT, TRANSPORT AND OFF-SITE DISPOSAL

Excavated soil, fill, and solid waste will be handled, transported, and disposed in accordance with applicable Part 360 regulations and other applicable local, state, and federal regulations. The proposed disposal facility(ies) and/or reuse site(s) will be reviewed and approved by Langan before any materials leave the Site. Non-hazardous impacted soil and hazardous wastes (not anticipated) will be transported off-Site for disposal, with the intent of achieving Track 1 objectives.

The Remediation Engineer will oversee the load-out of excavated material. Once the loading of any container, dump truck, or trailer has been completed, the material will be immediately transported to the off-Site disposal and/or recycling facility. Transport of materials will be performed by licensed haulers in accordance with appropriate local, state, and federal regulations. Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate federal, state, local, and NYSDOT requirements (or other applicable transportation requirements). Egress points for truck and equipment transport from the Site will be clean of dirt and other materials during Site remediation and development.

Measures to mitigate dust during loading and transport are outlined in a dust suppression plan, as presented in Stormwater Pollution Prevention Plan (Section 7.0). In accordance

with the dust suppression plan, the Remediation Engineer will monitor and document that trucks and equipment leaving the Site are washed at the truck wash until impacted soil has been removed from the Site.

The Final Remediation Report will include an accounting of the destination of material removed from the Site, including excavated impacted fill, solid and hazardous waste (if any), fluids, and documentation associated with that disposal showing requisite approvals for receipt of the material.

Any hazardous wastes derived from on Site will be stored, transported, and disposed in full compliance with applicable local, state, and federal regulations.

6.7 SOIL REUSE

Soil stockpiled in Stockpile Area 3 will be characterized for on-Site reuse consistent with the sampling protocol defined in DER-10. These materials will be tested for the TAGM parameter list of analytes and the results compared to TAGM 4046 RSCOs to determine their reuse potential. Any such soil that do not meet TAGM 4046 RSCOs, with the exception of selected non-critical compounds described in Section 6.1, will be disposed off-Site.

On-Site soil/fill that is deemed non-impacted based on TAGM 4046 RSCOs, but that contains organic matter (wood, roots, stumps, etc.) or other solid waste will not be reused on the Site. Imported fill that is inspected and confirmed to contain any of these materials will similarly be rejected for reuse on Site. Impacted fill will not be reused as backfill material on the Site.

6.8 IMPORT OF SOIL FOR BACKFILL

Soil imported to the Site for use as backfill or for cover soil will meet TAGM 4046 RSCOs. Before soil are brought onto the Site, the Construction Manager will supply Langan with the name, location, a brief history, and certified analytical test results for soil originating at the

proposed site or facility for review and approval. No soil will be imported to the Site before they are inspected by Langan. Soil materials that exceed TAGM 4046 RSCOs and contain solid waste will not be imported onto the Site.

7 STORMWATER POLLUTION AND PREVENTION PLAN

This plan identifies standard and Site-specific measures that will be implemented by the Excavation Contractor to minimize erosion and sedimentation, and consequently storm-water pollution, during remediation activities. Measures will include physical methods to control and/or divert surface water flows and to limit the potential for erosion and migration of Site soil, via wind (dust) or water. This Section also contains a dust suppression plan. The erosion and sediment controls will be in conformance with the requirements presented in New York State Guidelines for Urban Erosion and Sediment Control.

7.1 STORMWATER RUNOFF CHARACTERISTICS

Currently, storm-water runoff from the Site is collected via a series of on-Site catch basins and conveyed via an underground pipe network to existing combined sewers located along 80th Street, 83rd Street, and Doran Avenue. The combined sewers are tributaries to the existing Bowery Bay Water Pollution Control Plant.

During construction, the existing on-Site pipe network will be used to convey the stormwater runoff off-Site. It is expected that most of the stormwater will percolate into the ground once the existing buildings and pavement are removed and the underlying sandy soil are exposed. Localized areas may need to be pumped into the existing systems after large rainfall events and the capacity of the soil is exceeded.

The planned redevelopment of the Site includes buildings (both new and renovated), paved streets, sidewalks, courtyards, and landscaped areas. A network of new catch basins and underground pipes will convey the stormwater runoff to a new on-Site underground detention basin. The new basin will connect to the existing combined sewer systems along 80th Street.

7.2 STORMWATER POLLUTION PREVENTION CONTROLS

The stormwater pollution prevention controls for the project include stabilization practices and structural practices as itemized below. These controls will be constructed in accordance with the New York Standards and Specifications for Erosion and Sediment Control.

Stabilization Practices

- Surface cover removal activities shall be completed only in areas where earthwork will be performed and shall progress as earthwork is needed
- Frequent watering of excavation and fill areas to minimize wind erosion during construction (if necessary)

Structural Practices

- Inlet protection and outlet protection using filter fabric and hay bales
- Site perimeter and soil stockpile protection using silt fence
- Temporary sediment basins and sump pits
- Stabilized construction entrance/exit pads
- Existing combined sewer infrastructure

During the soil excavation activities, surface-water diversion methodologies will be implemented to minimize the amount of water that enters an excavation area. The Remediation Engineer will take appropriate action to maintain the integrity of the excavation floor, as deemed necessary. Surface water diversion methods may include (but are not limited to) channeling surface water flow around the soil excavation areas by excavating a temporary ditch, construction of berms, or installing piping to create a preferential flow path for the surface water around each excavation area.

Stormwater runoff from the truck wash area will be conveyed into the existing on-Site sewers via gravity or pumping. This area will also be surrounded with silt fence. No water

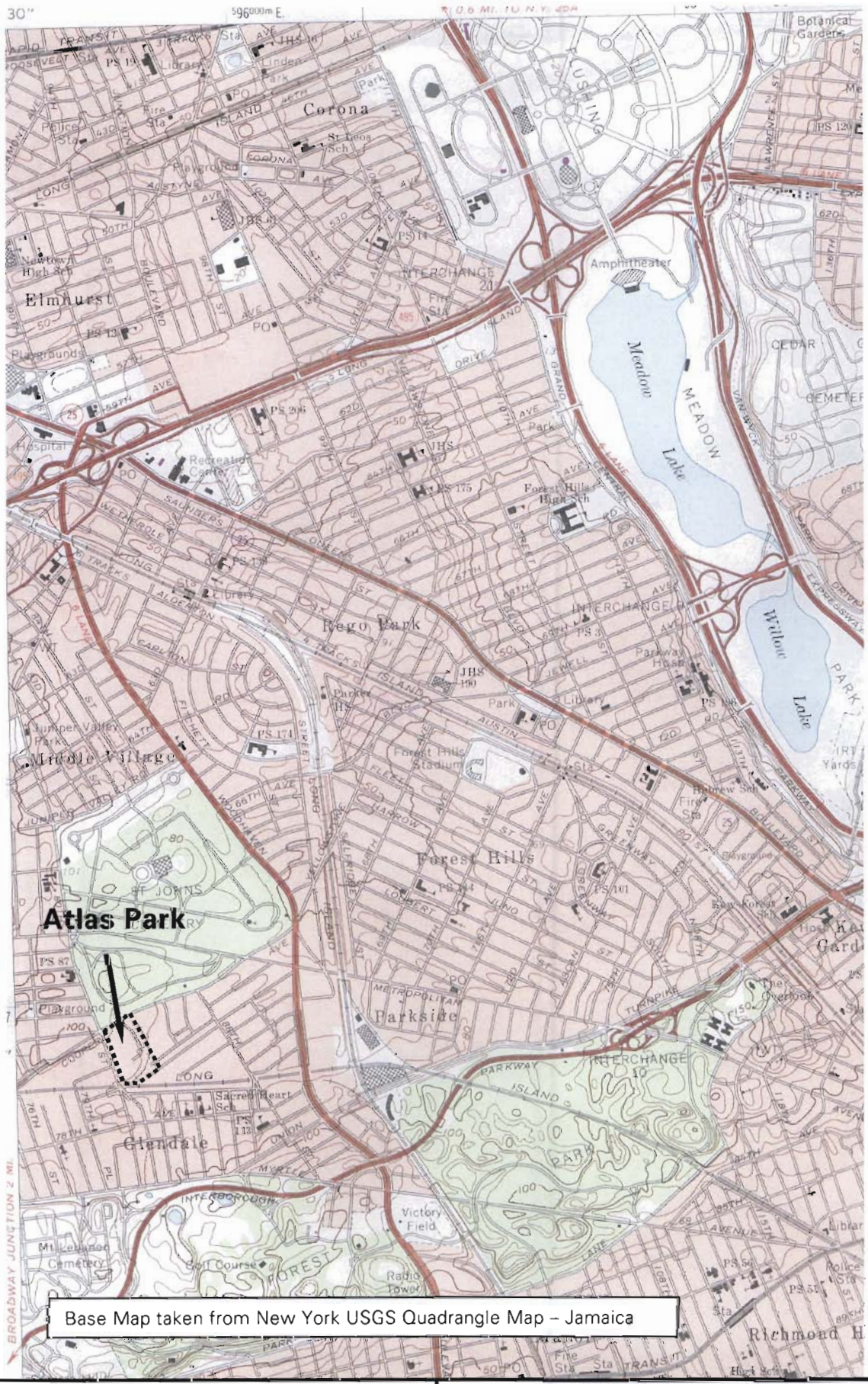
shall be conveyed directly to the City streets. The truck wash areas will be constructed as described in Section 6.3, and will include a sump and low permeable liner to collect the possibly impacted water, and a sedimentation tank to separate the solids from the water. Specific detail must be adhered to regarding the construction of the soil stockpile areas, the stabilized construction entrance/exit pads and the truck wash areas. Soil stockpiles are to be constructed for the staging of impacted soil as well as presumed non-impacted soil, pending loading for off-Site disposal or characterization testing. These stockpiles shall be constructed and maintained in accordance with Section 6.5. In addition, a double row of silt fence shall surround every stockpile at any stage of its construction.

7.3 SEQUENCE OF MAJOR ACTIVITIES

The Contractor will implement soil erosion and sediment control measures to maintain storm water quality and prevent the spread of impacted material. The work will be performed under inspection by the Remedial Engineer to document quality control. To this end, the order of major activities will be generally as follows:

1. Construct stabilized construction entrance/exit pads
2. Install perimeter silt fences and inlet protection on existing catch basins
3. Construct truck wash area(s) in accordance with Section 6.3
4. Begin mass excavation and grading operations
5. As soil stockpile areas are constructed install silt fencing
6. Maintain stormwater pollution prevention controls in accordance with Section 7.5 throughout entire operation.
7.

Note that the above sequence is relevant for the mass excavation and grading of the Site, including the removal of the impacted material, and does not continue beyond the performance of this work.



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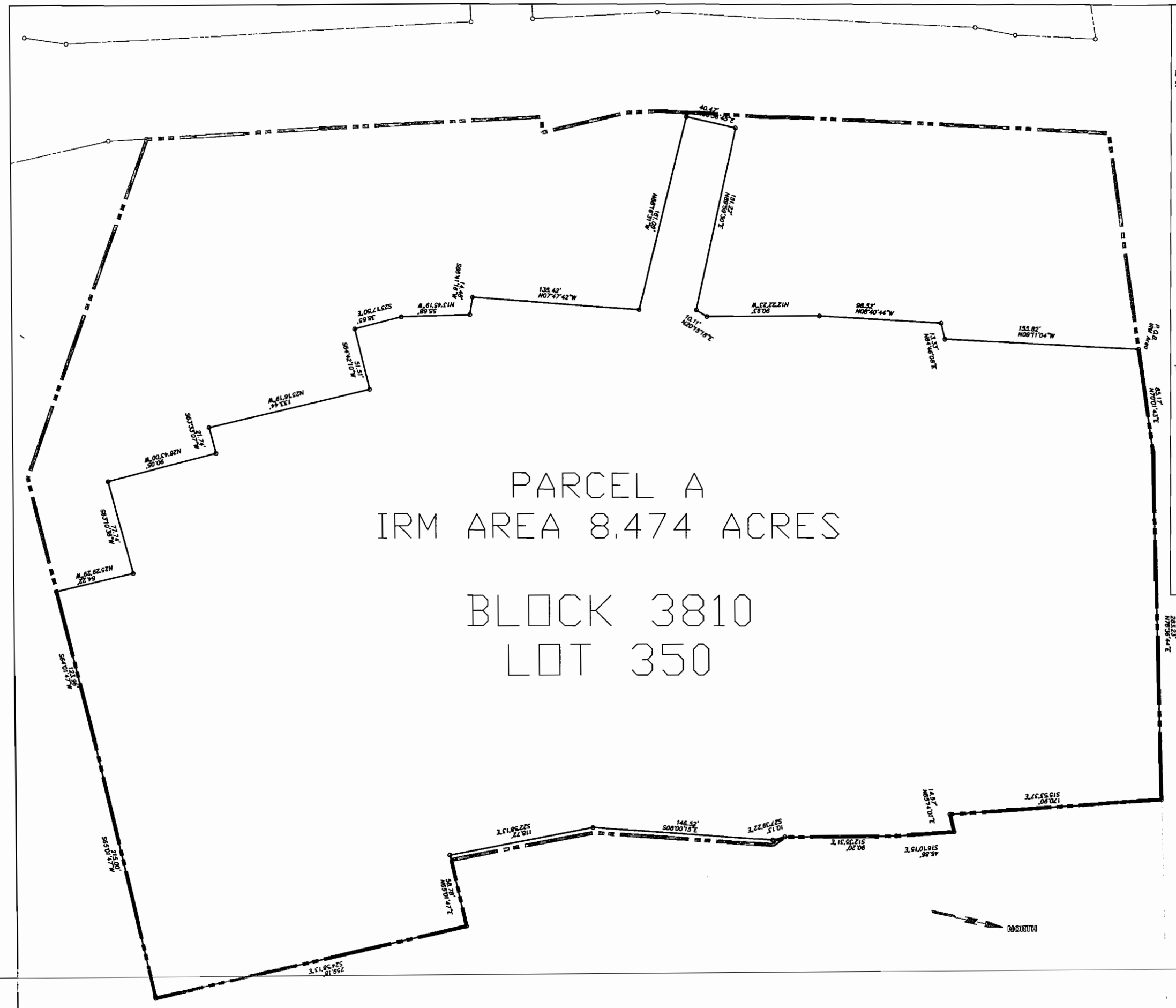
SITE LOCATION MAP
THE SHOPS AT ATLAS PARK
REMEDIAL ACTION WORK PLAN

Queens — New York

PROJ.NO	5555107	SCALE:	NTS	DATE	08/12/05	FIG:	1



IRM AREA METES AND BOUNDS
ATLAS PARK SITE – PARCEL A
BLOCK 3810 LOT 350
GLENDALE, NY

Beginning at a point on the southerly line of Cooper Avenue, said point being distant North 70°01'43" East 177.67 feet from the intersection of said southerly line of Cooper Avenue and the easterly line of 80 Street and running, thence:

1. Along said southerly line of Cooper Avenue, North 70°01'43" East, a distance of 85.17 feet to a point; thence
2. Still along said southerly line of Cooper Avenue, North 76°36'44" East, a distance of 283.23 feet to a point on the westerly line of Block 3810 Lot 2; thence
3. Along said westerly line of Block 3810 Lot 2, South 15°53'37" East, a distance of 170.90 feet to a point; thence
4. Still along said westerly line of Block 3810 Lot 2, North 65°14'01" East, a distance of 14.57 feet to a point; thence
5. Still along said westerly line of Block 3810 Lot 2, South 16°10'15" East, a distance of 46.86 feet to a point; thence
6. Still along said westerly line of Block 3810 Lot 2, South 12°35'31" East, a distance of 90.20 feet to a point; thence
7. Departing said westerly line of Block 3810 Lot 2, South 27°39'22" East, a distance of 10.13 feet to a point; thence
8. South 08°00'15" East, a distance of 146.52 feet to a point; thence
9. South 22°58'13" East, a distance of 118.72 feet to a point; thence
10. North 65°01'47" East, a distance of 58.78 feet, running partly along the aforementioned westerly line of Block 3810 Lot 2, to a point; thence
11. Along said westerly line of Block 3810 Lot 2, South 24°58'13" East, a distance of 259.18 feet to a point on the southerly line of Block 3810 Lot 350; thence
12. Along said southerly line of Block 3810 lot 350, South 65°01'47" West, a distance of 215.00 feet to a point; thence
13. Still along said southerly line of Block 3810 lot 350, South 64°01'47" West, a distance of 123.96 feet to a point; thence

Through Block 3810 Lot 350 the following 18 courses:

14. North 25°29'29" West, a distance of 64.22 feet to a point; thence
15. South 63°10'38" West, a distance of 77.74 feet to a point; thence
16. North 26°43'00" West, a distance of 90.05 feet to a point; thence
17. South 63°33'07" West, a distance of 21.74 feet to a point; thence
18. North 25°16'19" West, a distance of 133.44 feet to a point; thence
19. South 64°42'10" West, a distance of51.51 feet to a point; thence
20. North 25°17'50" West, a distance of 38.65 feet to a point; thence
21. North 13°45'19" West, a distance of 55.68 feet to a point; thence
22. South 86°41'16" West, a distance of 14.48 feet to a point; thence
23. North 07°47'42" West, a distance of 135.42 feet to a point; thence
24. North 88°16'31" West, a distance of 161.09 feet to a point; thence
25. North 00°36'45" East, a distance of 40.47 feet to a point; thence
26. North 89°59'30" East, a distance of 151.22 feet to a point; thence
27. North 20°15'18" East, a distance of 10.11 feet to a point; thence
28. North 12°22'23" West, a distance of 90.93 feet to a point; thence
29. North 08°40'44" West, a distance of 98.52 feet to a point; thence
30. North 64°46'06" East, a distance of 13.33 feet to a point; thence
31. North 09°11'04" West, a distance of 156.82 feet to a point to the Point of Beginning.

Encompassing an area of 8.474 acres, more or less.

LEGEND:

IRM METES AND BOUNDARY LINE

SITE PROPERTY LINE

No.	Description	Date
	Revisions	

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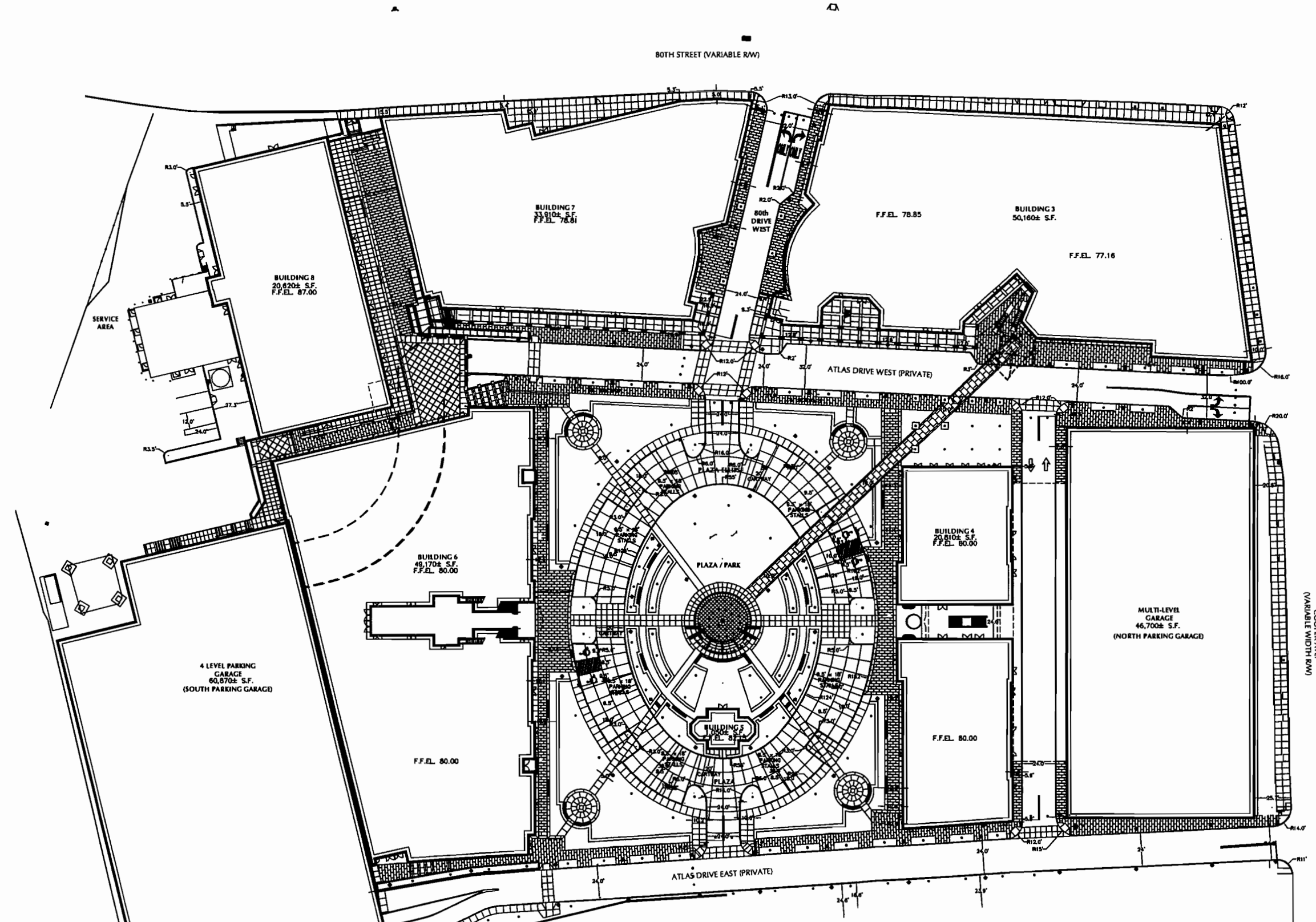
Project
THE SHOPS AT ATLAS PARK
QUEENS NEW YORK

Drawing Title
IRM METES AND BOUNDS ~~ATLAS PARK SITE~~ PARCEL A

Project No	[illegible]
Date	[illegible]
Scale	1" = 80'
Drn. By	JPS
Last Revised	

FIGURE: 2 Of

Filename: I:\Data1\355107\Office Data\Reports\IAMP for IRM Area\Figures\Submitted on 072305\Fig 2_IRM_Metes and Bounds...072105.dwg Date: 8/12/2008 Time: 11:31 User: tsung Style Table: Langan.stb Layout: IRM



LEGEND

SITE BOUNDARY

EXISTING BUILDINGS

PROPOSED BUILDINGS

NOTES

1. BASE SURVEY PLAN WAS OBTAINED FROM A DRAWING TITLED CITY OF NEW YORK, COUNTY OF QUEENS, TAX BLOCK 3810, TAX LOT 2, BY MONTROSE SURVEYING CO., LLP. DATED 17 DECEMBER 2001 SUPPLIED BY ATCO.

2. ELEVATIONS ARE REFERENCED TO BOROUGH PRESIDENT OF QUEENS TOPOGRAPHICAL DATUM, WHICH IS 2.725 FT. ABOVE NGVD 1929 MEAN SEA LEVEL AT SANDY HOOK, NJ. (BPQ=USGS-2.725 FT).

3. PROPOSED SITE LAYOUT AND BUILDING LOCATIONS ARE TAKEN FROM THE LANGAN BASE DRAWING TITLED 5555111_sl01.

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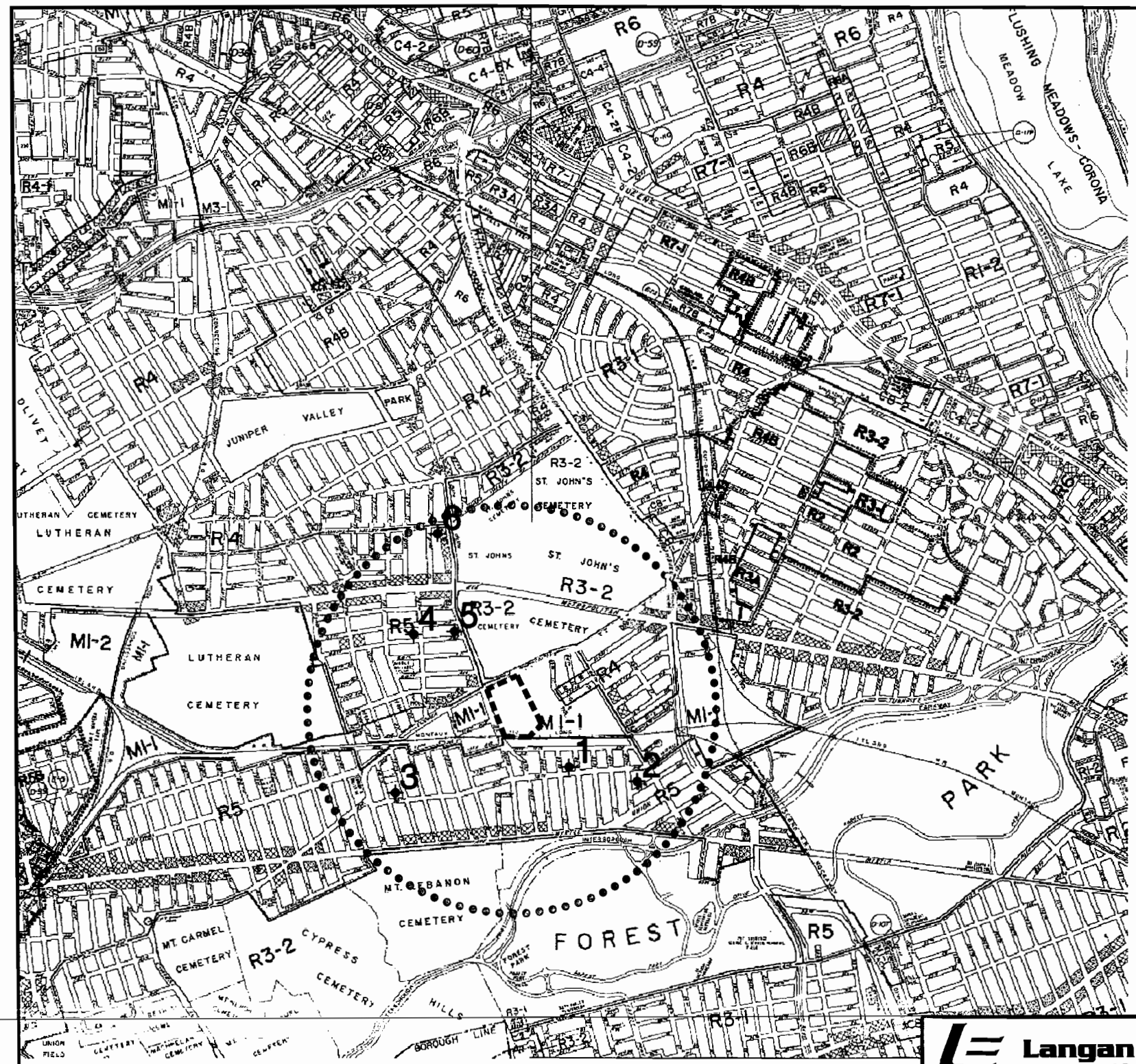
The Shops at Atlas Park

FURTURE SITE DEVELOPMENT

QUEENS NEW YORK

Project No.	Date	Scale	Dwg. No.
5555107	8/12/2005	NTS	3



LEGEND:

Commercial Truck Route (Site to Long Island Expressway)

Project Site Boundary (Approximate)

½ Mile Perimeter from Project Site Boundary

1 School or Day Care Location

SCHOOLS AND DAY CARE FACILITIES:

1. **SACRED HEART SCHOOL**
   84-05 78th Avenue
   Glendale, NY

2. **PUBLIC SCHOOL 113**
   87-21 79th Avenue
   Glendale, NY

3. **IS 119**
   74-01 78th Avenue
   Glendale, NY

4. **READY TO LEARN - CROWLEY EDUC. CENTER**
   PRE-SCHOOL/CHILD CARE
   67-52 79th Street
   Glendale, NY

5. **PUBLIC SCHOOL 87**
   67-54 80th Street
   Middle Village, NY

6. **ST. MARGARET'S CHURCH AND SCHOOL**
   66-16 80th Street
   Middle Village, NY

NEW YORK CITY ZONING CODES AND AREAS:

M1-1 - The subject property and the area immediately to the east and west are zoned "Light Manufacturing District (High Performance)." The district is characterized by small manufacturing facilities and small to large warehouses.

R-4, R-5 and R3-2 - Areas beyond the manufacturing district and areas to the north and south of the subject property are zoned "General Residence District." The district is characterized by single end multiple family residential buildings.

C1-2 - Cross-hatched areas within the ½ mile perimeter of the subject property are zoned "Local Retail District." The areas are characterized by retail stores to include restaureunts and clothing stores.

C2-2 - Darker Cross-hatched (includes a dots in the middle of the cross-hatch pattern) areas within the ½ mile perimeter of the subject property are zoned "Local Service District." The areas are characterized by service stores to include gas stations and auto service.

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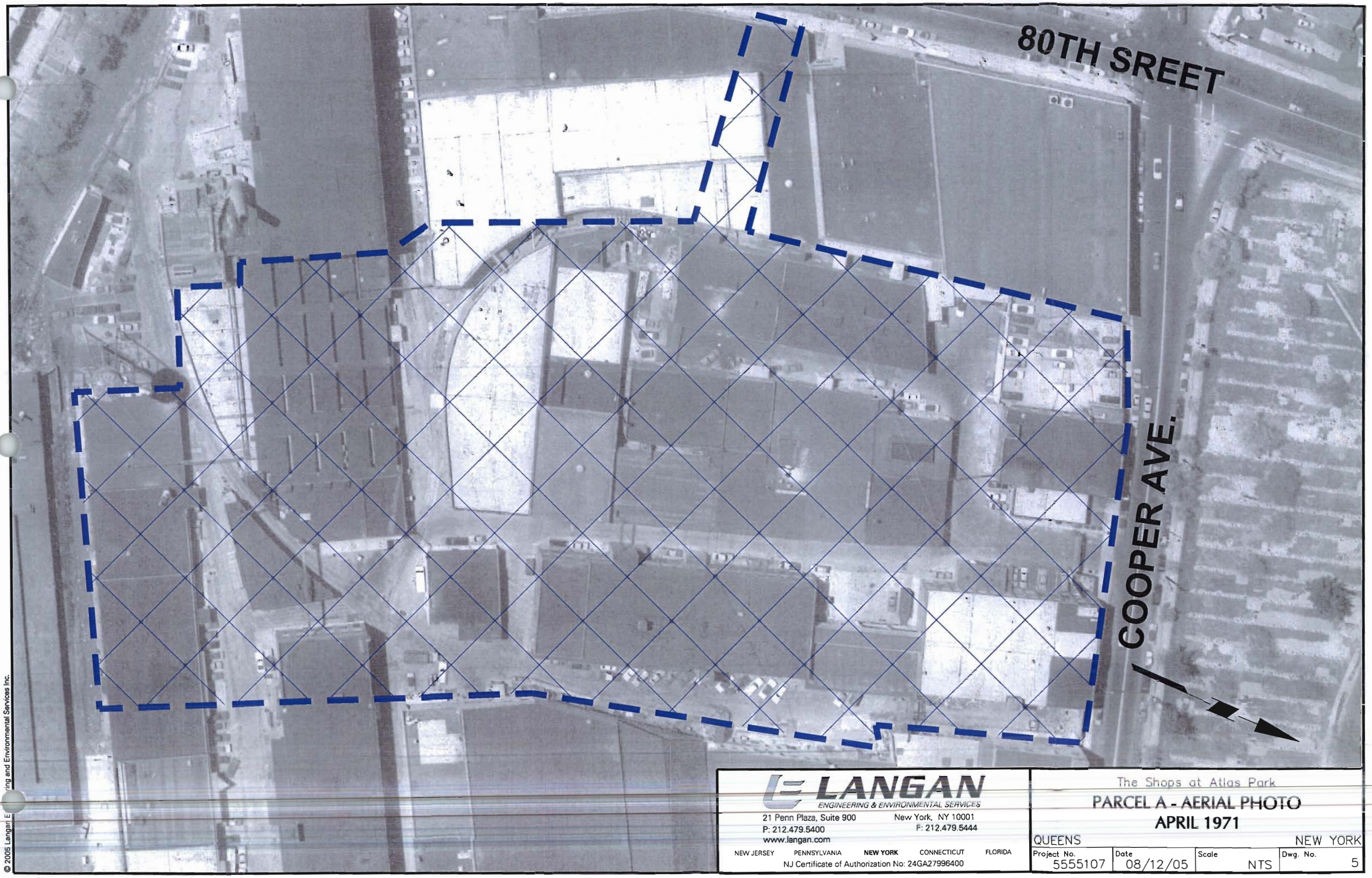
Project: THE SHOPS AT ATLAS PARK
REMEDIAL ACTION WORK PLAN
LAND USAGE AND TRUCK ROUTE PLAN
GLENDALE NEW YORK

Job No.	Date	Scale	Dwg. No.
5555107	3/12/04	As Shown	4



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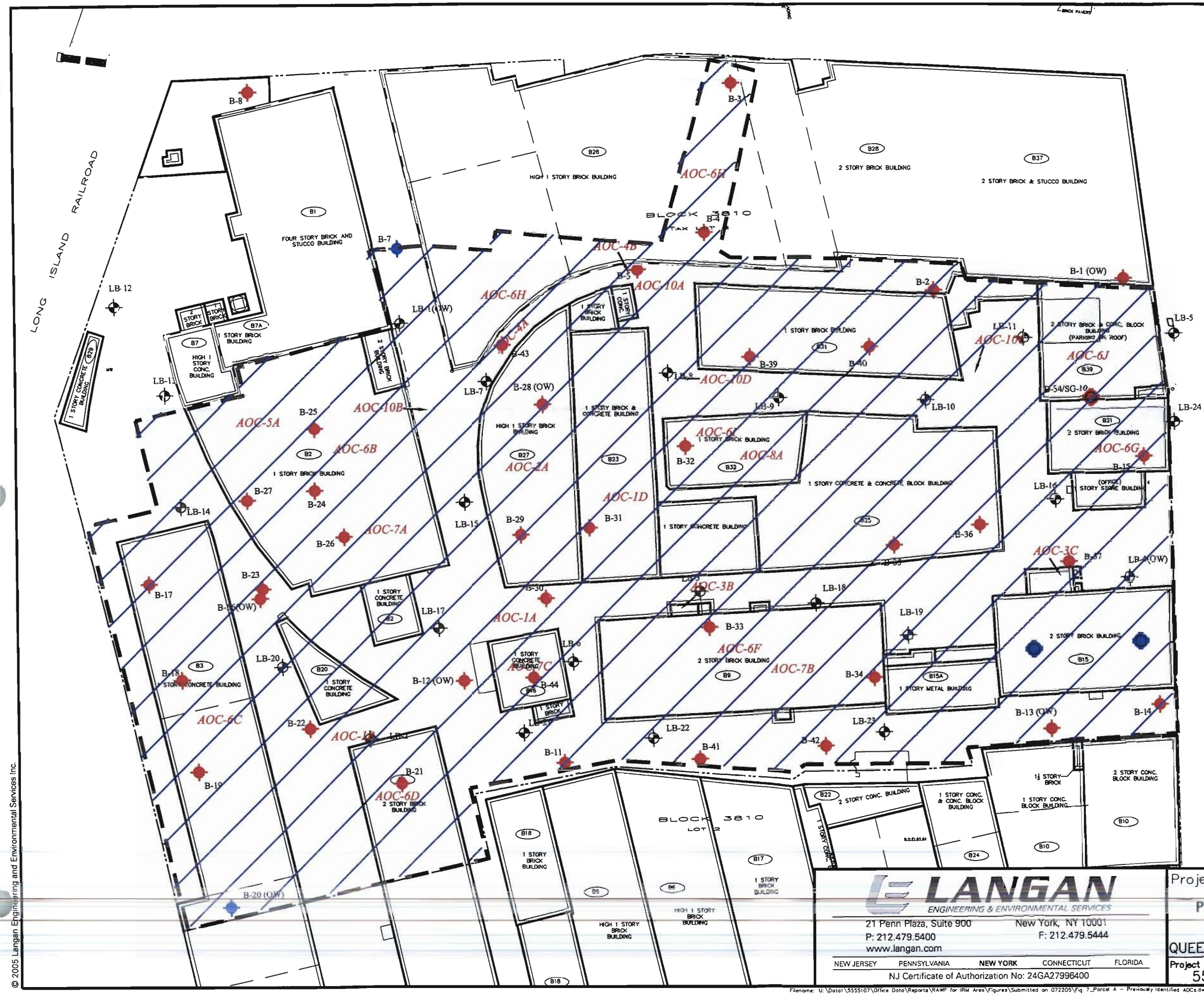
The Shops at Atlas Park

PARCEL A - AERIAL PHOTO
APRIL 1971

QUEENS NEW YORK

Project No.	Date	Scale	Dwg. No.
5555107	08/12/05	NTS	5



LEGEND:

- AREA OF CONCERN OUTLINE
- IRM BOUNDARY
- PROPERTY BOUNDARY
- AOC — AREA OF CONCERN
- B-1 — IRM SI SOIL BORING LOCATION
- SG-1 — IRM SI SOIL VAPOR SAMPLE LOCATION
- LB-6 — LANGAN GEOTECHNICAL BORING LOCATION
- SB-17 — METCALF & EDDY SOIL BORING LOCATION
- EXISTING BUILDINGS
- PARCEL A – IRM AREA

NOTES:

1. BASE SURVEY PLAN WAS OBTAINED FROM A DRAWING TITLED CITY OF NEW YORK, COUNTY OF QUEENS, TAX BLOCK 3810, TAX LOT 2, BY MONTROSE SURVEYING CO., LLP. DATED 17 DECEMBER 2001 SUPPLIED BY ATCO.
2. ELEVATIONS ARE REFERENCED TO BOROUGH PRESIDENT OF QUEENS TOPOGRAPHICAL DATUM, WHICH IS 2.725 FT ABOVE NGVD 1929 MEAN SEA LEVEL AT SANDY HOOK, NJ. (BPQ=USGS-2.725 FT)
3. PROPERTY INFORMATION ON THE WESTERN SIDE OF 80TH STREET HAS BEEN INTERPRETED FROM AERIAL PHOTOGRAPHS AND SKETCHES.
4. AOC-9A: HISTORICAL FILL MATERIAL FOUND THROUGHOUT ATLAS PARK. (NOT SHOWN ON PLAN)

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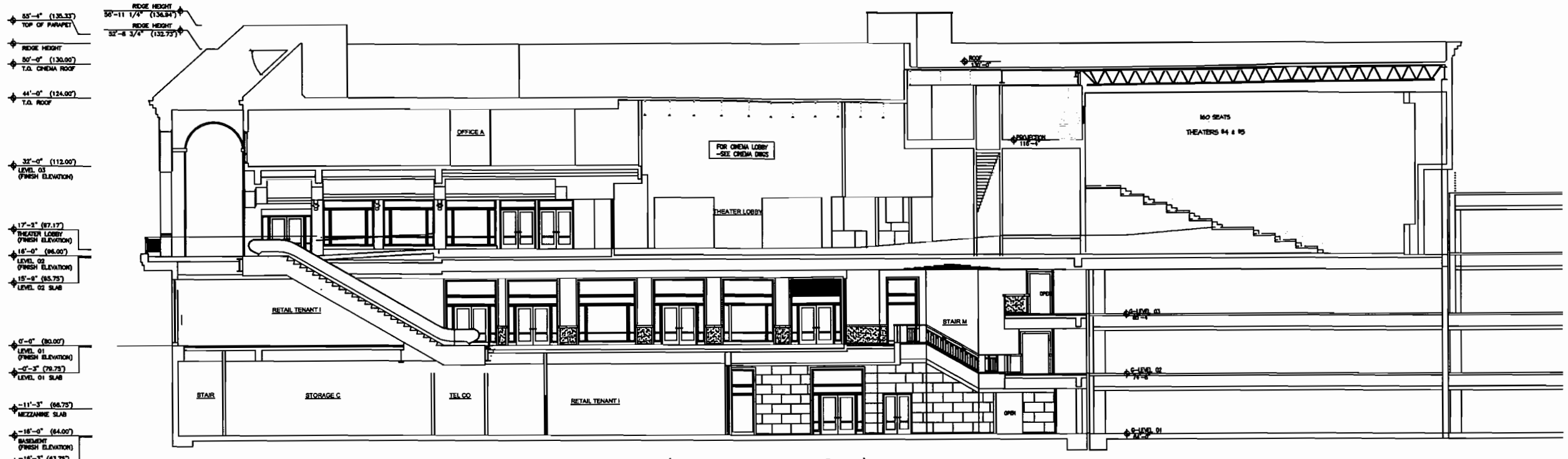
Project THE SHOPS OF ATLAS PARK

PREVIOUSLY IDENTIFIED AOCS AND IRM BORING LOCATION MAP

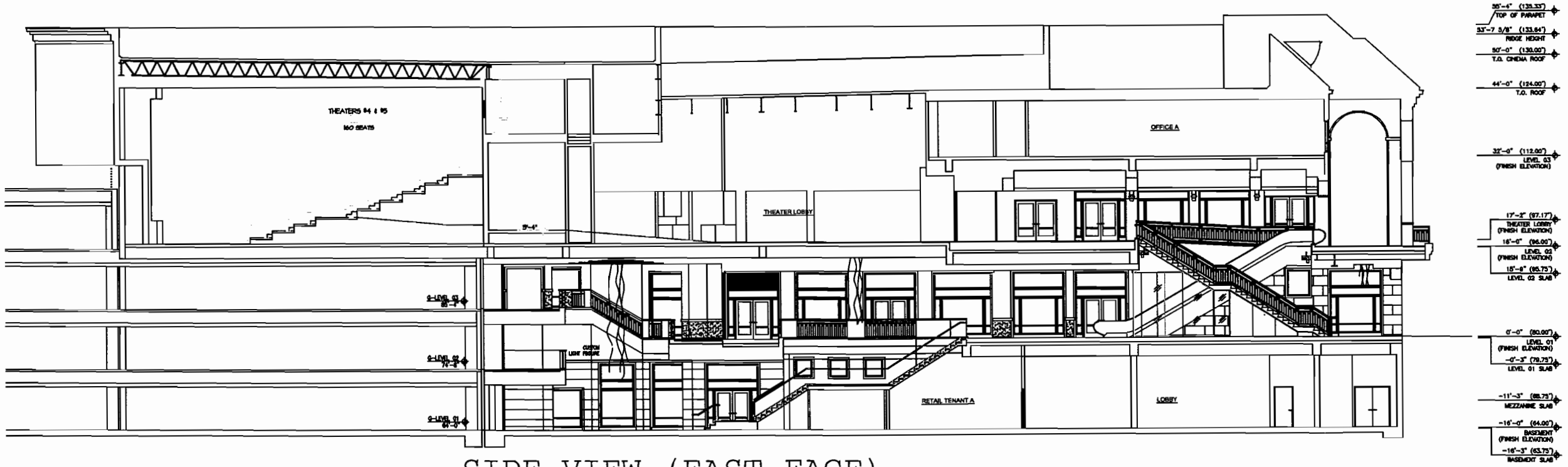
QUEENS NEW YORK

Project No.	Date	Scale	Dwg. No.
5555107	08/12/05	1:80	7

Filename: U:\Data1\5555107\Office Data\Reports\RAWP for IRM Area\Figures\Submitted on 072205\Fig 7_Parcel A – Previously Identified AOCs.dwg Date: 8/12/2005 Time: 11:21 User: tsung Style Table: Langan Color.stb Layout: Layout1-B Size Sheet (Bottom)



SIDE VIEW (WEST FACE)



SIDE VIEW (EAST FACE)

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ATLAS PARK

PROPOSED BUILDING 6
CROSS SECTION

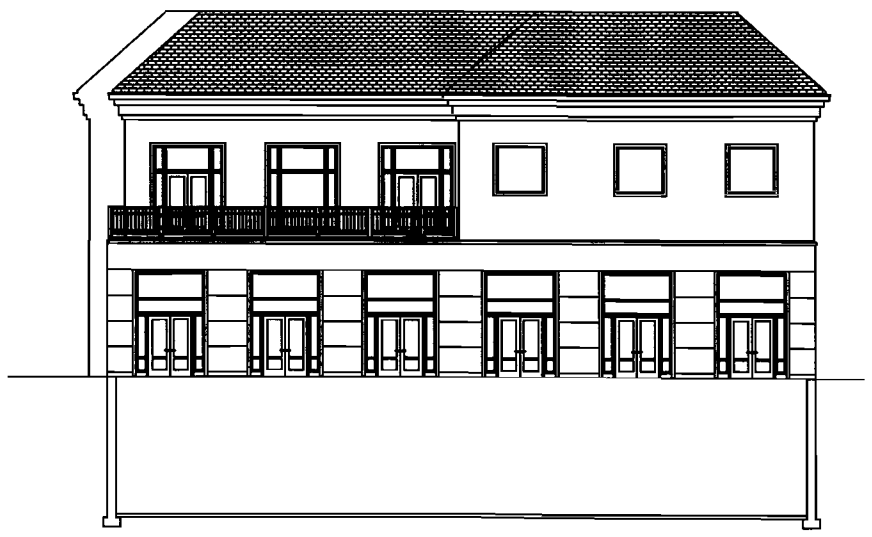
GLENDALE NEW YORK

Project No.	Date	Scale	Dwg. No.
5555107	08/12/05	NTS	9

Filename: U:\Data1\5555107\Office Data\Reports\RAWP for IRM Area\Figures\Submitted on 072205\Fig 9_Building 6 Cross Section.dwg Date: 8/10/2005 Time: 15:27 User: jbarr Style Table: Grayscale.ctb Layout: B Size Sheet (Bottom)

SIDE VIEW (SOUTH FACE)

SIDE VIEW (NORTH FACE)



SIDE VIEW (EAST FACE)

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ATLAS PARK

PROPOSED BUILDING 4 CROSS SECTION

GLENDALE NEW YORK

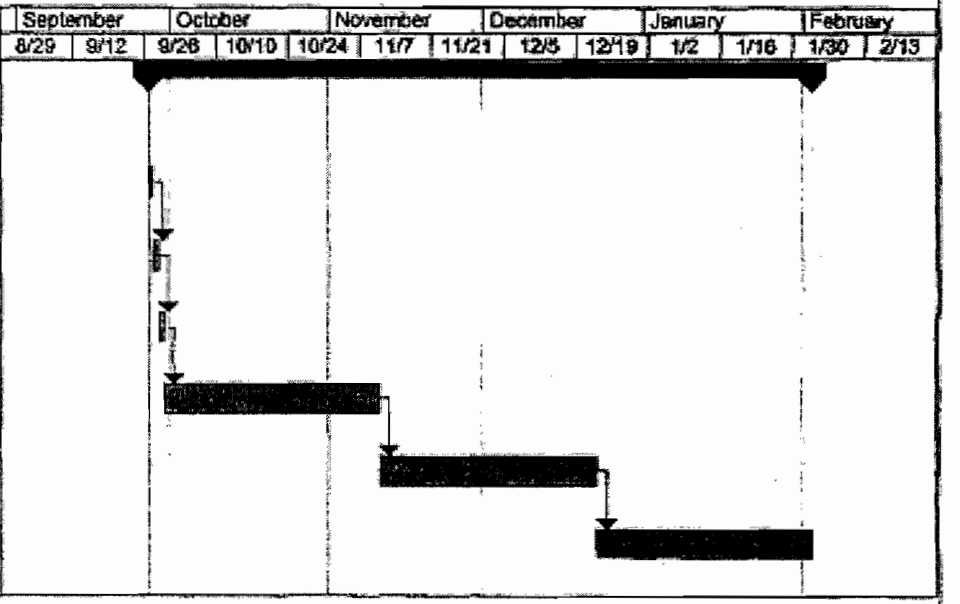
Project No.	Date	Scale	Dwg. No.
5555107	08/12/05	NTS	10

Filename: U:\Data1\5555107\Office Data\Reports\RAWP for IRM Area\Figures\Submitted on 072205\Fig 10_Building 4 Cross Section.dwg Date: 8/10/2005 Time: 15:28 User: jbarr Style Table: Langan.stb Layout: B Size Sheet (Bottom)

FIGURE 11

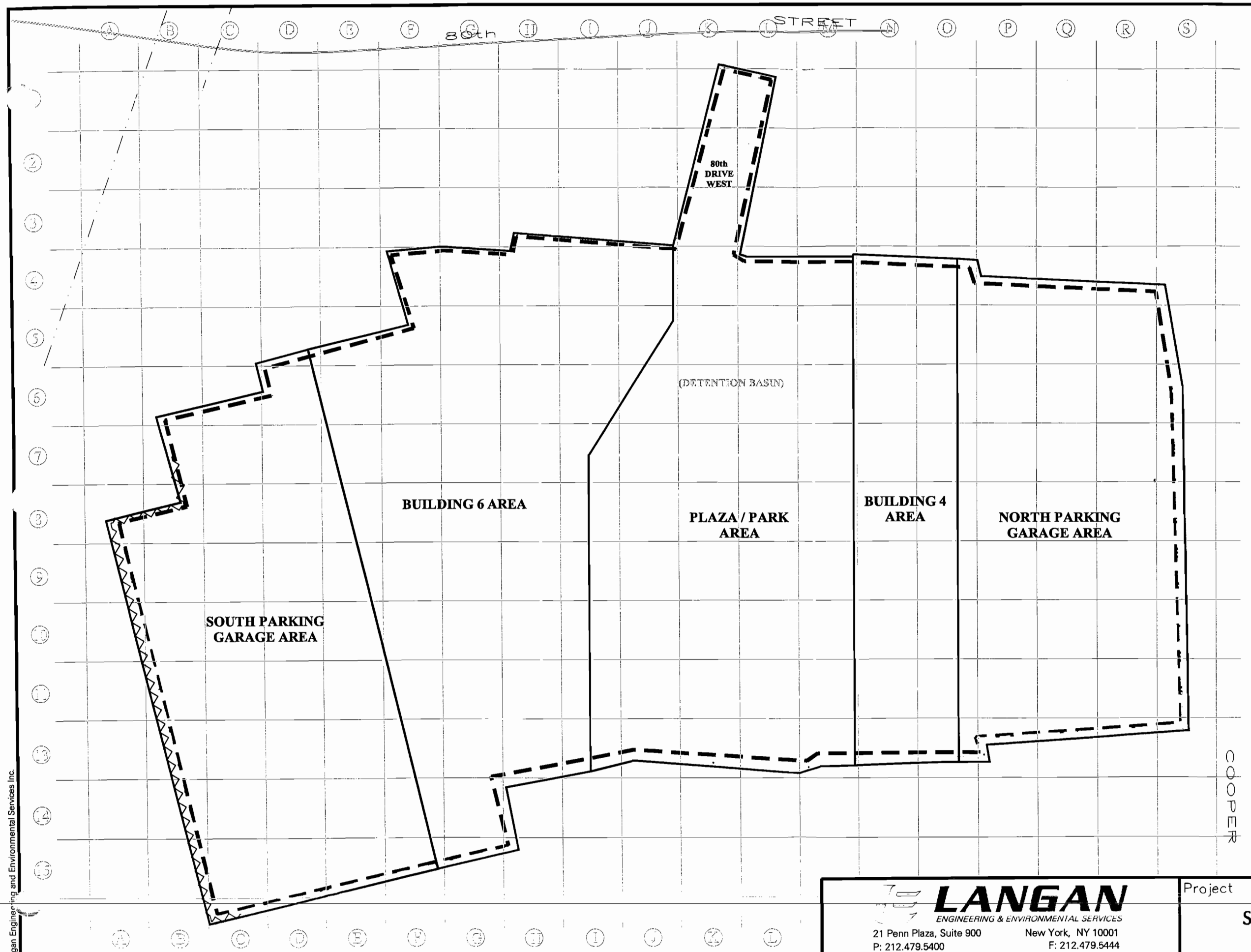
PROPOSED REMEDIAL ACTION SCHEDULE
REMEDIAL ACTION WORK PLAN
ATLAS PARK SITE - PARCEL A
GLENDALE, NY
September, 2004 through Febraury, 2005

ID	Task Name	Duration	Start	Finish
1	**Interim Remedial Measure Excavation and Remediation**	**93 days**	**Mon 9/27/04**	**Wed 2/2/05**
2	Sedimentation & Erosion Control	1 day	Mon 9/27/04	Mon 9/27/04
3	Truck Wash Sump Construction	1 day	Tue 9/28/04	Tue 9/28/04
4	Stockpile Construction	1 day	Wed 9/29/04	Wed 9/29/04
5	Interim Measure Phase 1	30 days	Thu 9/30/04	Wed 11/10/04
6	Interim Measure Phase 2	30 days	Thu 11/11/04	Wed 12/22/04
7	Interim Measure Phase 3	30 days	Thu 12/23/04	Wed 2/2/05



Project: Atlas Park
Date: 09/27/04

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline



LEGEND:

- PROPERTY LINE
- IRM BOUNDARY
- EXTENT OF SHEETING / SHORING
- CONSTRUCTION AREA BOUNDARY
- NEW BUILDING / STRUCTURE FOOTPRINT
- EXCAVATION GRID (50-FOOT GRID)

NORTH

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Project

SITE MAP WITH ALPHA GRID

QUEENS NEW YORK

Project No.	Date	Scale	Dwg. No.
5555107	08/12/05	1": 80'	12

TA : 1
SUMMARY OF AOCs AND TAGM EXCEEDANCES
REMEDIAL ACTION WORK PLAN
ATLAS PARK - PARCEL A
GLENDALE, NY

AOC	Description	TAGM Exceedances
AOC-1A	Former Gasoline Station	SVOCs, Zinc
AOC-1B	Building 20 (Underground Storage Tanks)	Zinc
AOC-1D	Building 23 (Underground Storage Tanks)	SVOCs, Mercury, Zinc
AOC-2	Building 27 (Valve Vault)	SVOCs, Zinc, Magnesium, Nickel
AOC-3B	Building 9 (Transformer)	Zinc
AOC-3C	Building 15 (Transformer)	Zinc, Mercury
AOC-4A	Between Building 27 and Building 28 (Rail Yard)	SVOCs
AOC-4B	Between Building 23 and Buliding 28 (Rail Yard)	Benzo(a)pyrene, Zinc, Magnesium
AOC-5	100,000 Gallon Concrete Reservoir	N/A
AOC-6B	Building 2 (Chemical Storage)	SOVCs, Mercury, Zinc,
AOC-6C	Building 3 (Chemical Storage)	Calcium, Zinc
AOC-6D	Building 4 (Chemical Storage)	Mercury
AOC-6F	Building 9 (Chemical Storage)	SOVCs, Zinc
AOC-6G	Building 21 (Chemical Storage)	SVOCs
AOC-6H	Building 28 (Chemcial Storage)	benzo(k)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene
AOC-6I	Building 32 (Chemical Storage)	SVOCs, Mercury, Copper, Lead, Zinc
AOC-6J	Building 39 (Chemical Storage)	Chromium
AOC-7A	Building 2 (Historical Use)	SVOCs, Mercury, Zinc
AOC-7B	Building 9 (Historical Use)	Calcium, Zinc
AOC-7C	Building 16 (Historical Use)	SVOCs, Zinc
AOC-8A	Building 32 (Wastewater Discharge)	SVOCs, Mercury, Copper, Lead, Zinc
AOC-9	Historic Fill and Native Soil	See Note*

Note: Non-Critical metals include Zinc, Nickel, Calcium, and Copper

Note*: All thirty nine (39) soil borings completed as part of the IRM investigation (April, 2004) were used to delineate the nature fill and extent of both contaminated and non-contaminated historic

TABLE 2
EXCAVATION/REMOVAL OF CONTAMINATED SOILS COST ESTIMATE

REMEDIAL ACTION WORK PLAN
ATLAS PARK - PARCEL A
GLENDALE, NY

Item	Estimated Quantity	Units	Estimated Unit Cost	Estimated Total
CAPITAL COSTS				
Mobilization				
Mobilization/Demobilization	1	LS	$100,000	$100,000
Site Trailer and Utilities	1	LS	$40,000	$40,000
Excavation of Contaminated Soils				
Soil Excavation	107000	Ton	$20	$2,140,000
Category 1 Soil T&D	100000	Ton	$45	$4,500,000
Category 2 Soil T&D - Non Hazardous	4000	Ton	$100	$400,000
Category 2 Soil T&D - Hazardous	3000	Ton	$250	$750,000
Laboratory Analyses of Soil Samples	1	LS	$600,000	$600,000
Community Air Monitoring Program	1	LS	$175,000	$175,000
			TOTAL CAPITAL COSTS	$8,705,000
			Administration and Engineering (20%)	*$1,741,000*
			Contingency (20%)	*$1,741,000*
			ESTIMATED TOTAL COST FOR REMEDIATION	**$12,187,000**

TABLE 3
EMERGENCY CONTACTS

REMEDIAL ACTION WORK PLAN
ATLAS PARK - PARCEL A
GLENDALE, NY

Langan Contact		Phone Number	
		Day	Night
Principal/Associate	Joel Landes, P.E.	(212) 479-5404	(917) 940-3015
Program Manager	Marc Gallagher, P.E.	(212) 479-5408	(201) 913-7971
Project Manager	John Rhyner	(212) 479-5423	(917) 513-7259
Health & Safety Officer	Bob Koto, P.G.	(201) 398-4566	(201) 398-4566
Field Remediation Engineer/ Field Safety Officer	Jamie Barr	(212) 479-5449	(917) 882-5428
Alternate Field Safety Officer	Prithviraj Patil	(201) 794-4223	(201) 665-6432

APPENDIX A

QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT FOR PARCEL A

The Shops at Atlas Park
Glendale, Queens, NY

1.0 PURPOSE AND SCOPE

A qualitative human health exposure assessment is required for sites undergoing investigation and remediation under the New York State Brownfield Cleanup Program. A qualitative human health exposure assessment was conducted for both current and future Site conditions in accordance with the New York State Department of Health (NYSDOH) guidance provided in the New York State Department of Environmental Conservation (NYSDEC) Draft DER-10 regulations. The human health exposure assessment included an evaluation of potential sources of constituents of concern (COCs), human receptor populations, exposure pathways, and the fate and transport of the COCs. (A constituent of concern is defined as a regulated, potentially site-related compound). Pre-remedial/pre-construction conditions and conditions during remediation/construction were evaluated under the current conditions scenario.

The human health exposure assessment is based on the development of a conceptual site model, the procedures of which are outlined in the DER-10 regulations. The conceptual model presented herein is based on investigation data obtained during the IRM Site Investigation, and the conceptual model was used to support selection of the remedy. The focus of the qualitative human health exposure assessment for this Site is on potential exposures to historic fill and impacted soil under current (pre-remedial) conditions, during remedial activities, and after the property is developed. The potential for exposures to two volatile organic compounds (VOCs), specifically trichloroethene (TCE) and tetrachloroethene (PCE) present in groundwater and/or soil vapors, was also considered and evaluated. No on-site source of TCE or PCE was identified in the historic fill or soil at the Site.

2.0 SUMMARY OF QUALITATIVE HUMAN HEALTH EXPOSURE ASSESSMENT

Under current (pre-remedial/pre-construction) conditions, maintenance, construction, and demolition workers may be exposed to Site COCs in impacted historic fill that is excavated as part of Site improvements, routine maintenance, and demolition. Associated exposure pathways include dermal contact and ingestion of historic fill and impacted soil, and inhalation of dust containing COCs.

During remediation activities, human health exposures to Site COCs could occur for construction workers, area residents, and the general public, via direct contact and ingestion (construction workers only), and inhalation of fugitive dust containing COCs (all of the above receptors). Potential exposures can be minimized by following the appropriate health and safety, dust suppression, and site security measures contained within the RAWP including the Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP).

The plans for the Site are for it to be developed into a retail complex. During the remedial activities, historic fill and soil that exceed the NYSDEC TAGM 4046 recommended soil cleanup objectives (RSCOs) will be removed. It is anticipated that Track 1 cleanup objectives (i.e., unrestricted-use) will be met upon completion of the remedial excavation activities. The remedial excavation activities will eliminate potential future exposures to impacted Site soil. As a result, there will be no need to incorporate any engineering or institutional controls into the building construction plans to address residual impacted soil.

TCE and PCE were detected in several on-Site groundwater samples within the Upper Glacial aquifer beneath the Site, and in one on-site soil vapor sample. The potential for exposure to these COCs was considered and evaluated. There is minimal potential for direct exposure to TCE or PCE because the depth to groundwater beneath the Site is more than 55 feet below grade. In addition, the nearest public supply well is located nearly 2 miles from the Site and reportedly draws water from the deeper Magothy aquifer. Groundwater conditions and potential sources of VOCs in groundwater are being further evaluated as part of the Remedial Investigation of Parcel B to the west of the Site.

A potential exposure pathway exists between soil vapors and the indoor air of future buildings with basements (planned Buildings 4 and 6). As a pre-cautionary measure to address potential vapor intrusion, a sub-slab depressurization system (SSDS) will be installed beneath proposed Buildings 4 and 6. The purpose of these systems will be to eliminate the potential exposure pathway between the soil vapor and indoor air in the basements. The SSDS design is provided in Appendix B.

3.0 SITE SETTING

The Site comprises an 8.474-acre portion of a total 12-acre parcel undergoing redevelopment that is the subject of two separate Brownfield Cleanup Agreements under the NYSDEC Brownfield Cleanup Program (BCP). The Site (or Parcel A, formerly known as the "IRM Area") is bound by Cooper Avenue and Saint John's Cemetery to the north, Long Island Railroad easement to the south, the Atlas Terminals industrial park property to the east, and 80th Street and the second BCP parcel to the west (Parcel B, formerly known as the "RI Area"). Most recently, the Site was used for a mix of distribution/warehousing. Parcel A is distinguished from Parcel B since this 8.474-acre parcel will be substantially excavated to remediate the impacted historic fill and soil, and to accommodate new on-Site construction of sub-grade parking garages, subsurface utilities, buildings with basement levels, and new building foundations. The development on Parcel B (3.526 acres) will not involve excavation, but only renovation of pre-existing buildings.

The areas surrounding the Site are zoned mixed residential and manufacturing. The area west of the Site, across 80th Street is predominantly zoned for light manufacturing, with some private residences. There is an industrial, triangular-shaped property to the south between the Site and the Long Island Rail Road (LIRR) easement; the areas immediately south of the LIRR easement are primarily residential. The Atlas Terminals industrial site lies due east of the Site; the area further to the east across 83rd Street is a mixture of residential and manufacturing properties.

4.0 PROPOSED PROJECT

Atlas Park, LLC began demolishing buildings on the Site in April 2004 in anticipation of construction beginning in October 2004. Prior to construction, all buildings within Parcel A, as shown on Figure 3 of this RAWP, were demolished in preparation for the removal of soil exceeding TAGM 4046 RSCOs, and construction of several buildings and sub-grade parking structures for the retail development.

A dynamic new commercial retail project, to be called The Shops at Atlas Park, will cover the entire 12-acres, and will include shopping, entertainment, dining, and office space. The project will be designed around a two-acre, open-air, landscaped park. The Shops at Atlas Park is anticipated to open in the first quarter of 2006.

5.0 CONCEPTUAL SITE MODEL

A conceptual Site model has been developed based on the findings of the IRM Site Investigation Report and prior investigations. The purpose of the conceptual Site model is to develop a simplified framework for understanding the distribution of impacted materials, potential migration pathways, receptor populations, and potential exposure pathways as discussed below.

5.1 Summary of Environmental Conditions

5.1.1 Potential Sources of Constituents of Concern

A description of the potential areas of concern (AOCs) identified for the Site can be found in Section 2.3.4 of the RI and IRM Work Plan. The potential AOCs are summarized in Table 1 and Figure 7 of this RAWP. It should be noted that with the exception of AOC 9, which is the historic ash/fill layer, none of the potential AOCs were confirmed as actual AOCs during the IRM Site Investigation. The historic fill may have been brought onto the Site during the development of the industrial park. The ash/fill layer varies in thickness and exists over approximately 80% of the Site. The ash/fill layer contains certain semi-volatile organic compounds (SVOCs) and metals above NYSDEC RSCOs in certain areas.

A number of USTs were present on the Site, and they were removed prior to the IRM Site Investigation. Visual inspection and confirmatory sampling in and around the USTs did not indicate the presence of petroleum-related COCs.

TCE and PCE were detected in several on-Site groundwater samples and in one on-site soil vapor sample. No on-Site source of TCE or PCE was identified in the fill/soil. A discussion of the groundwater data is included in Section 5.3.1 of the IRM Site Investigation Report.

5.1.2 Summary of Prior Environmental Sampling

The analytical data obtained during the IRM Site Investigation for soil and groundwater were reviewed to identify COCs. A summary of the data is presented below, separately for soil and groundwater.

Soil

- Volatile Organic Compounds (VOCs): No VOCs were detected above TAGM RSCOs in any of the 114 soil samples collected throughout the Site, with the exception of acetone, which was concluded to be a field equipment decontamination artifact.
- SVOCs: SVOCs, primarily polycyclic aromatic hydrocarbons (PAHs), exceeded TAGM RSCOs in approximately 25 percent of the soil samples collected throughout the Site. SVOC exceedances occurred in samples collected from within the fill layer, and from grade surface to 13 feet below grade.
- Metals: Metals (specifically mercury, cadmium, copper, chromium, and lead) exceeded TAGM RSCOs in approximately 20 percent of the soil samples collected throughout the Site. Metal exceedances occurred in samples collected from within the fill layer and from grade surface to 11 feet below grade.

Groundwater

- VOCs: PCE was detected in groundwater at concentrations exceeding its respective NYSDEC Ambient Water Quality Standard (AWQS) in one well in the central portion of the Site at a concentration ranging from 11 to 23 micrograms per liter (ug/L). TCE was detected above its AWQS in one well in the south portion of the Site at a concentration of 6.1 ug/L.
- SVOCs: One SVOC, 4-Methylphenol, exceeded its NYSDEC ambient water quality guidance value.
- Metals: Iron, magnesium, manganese, and sodium were detected in all groundwater samples above their respective AWQS or guidance values. These results are consistent with the native soil conditions at the site and documented background groundwater conditions. (See the IRM Site Investigation Report for data summaries and discussion.)

Soil Vapor

- VOCs: PCE was detected in one soil vapor sample at a concentration of 450 micrograms per kilogram (ug/kg). TCE was not detected in this soil vapor sample.

5.1.3 Constituents of Concern (COCs)

A constituent of concern (or "chemical of potential concern", as per USEPA *Risk Assessment Guidance for Superfund - Part A*, EPA/540/I-89/002, December 1989, Office of Emergency and Remedial Response) is defined as a potentially site-related, regulated compound. Site-specific COCs were determined from a review of the Site analytical

data for soil and groundwater (see Section 4.1.2). The COCs are discussed below and are listed in Table A-1 of this Appendix. The COCs are organized in Table A-1 by media and type of compound (i.e., SVOCs, metals, and VOCs).

Soil - The COCs for the historic fill layer were identified to be seven PAHs, namely benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene, and metals, which consisted of mercury, arsenic, cadmium, chromium, copper, and lead.

Groundwater - PCE and TCE were detected in the groundwater aquifer more than 55 feet beneath the Site at concentrations above their respective AWQS. However, they are not considered COCs for groundwater because there were no on-Site sources of PCE/TCE identified on Parcel A, and because direct contact with groundwater is unlikely. PCE and TCE in groundwater were considered with respect to their potential to volatilize from the groundwater beneath the Site and migrate upwards in a vapor phase (see below).

Soil Vapor - PCE was detected in the one soil vapor sample collected on the Site at a concentration above the NYSDOH guidance value. However, PCE is not considered a COC for soil vapor because there were no on-Site sources of PCE/TCE identified on Parcel A. The occurrence of PCE (and TCE) was considered and evaluated given their presence in groundwater beneath the Site and potential to migrate upwards from groundwater towards the planned new Site buildings, and given the recent NYSDOH guidance values limiting their concentrations in indoor air and soil vapors.

5.2 Fate and Transport of COCs

Both compound-specific and site-specific factors control the transport and eventually the fate of compounds in the environment. Compound-specific factors are intrinsic properties of each of the individual COCs. The most important of these compound-specific factors include volatility (measure of vapor pressure and water solubility), specific gravity, solubility in water, and the potential capacity of the compound to adsorb onto organic matter in soils. Site-specific factors include the physical characteristics of the Site, hydrogeologic conditions including the depth to the groundwater reservoir (water table depth), soil particle size, and type of cover material.

The environmental media that are potential pathways for the migration of COCs are soil, groundwater, soil vapor, and air. The environmental fate and transport of the COCs within and between these media are discussed below.

5.2.1 Soil and Air

Some PAHs and metals were identified as COCs in the historic fill layer. In general, both the PAHs and metals have overall low volatility and solubility, and a high capacity to sorb onto to the soil matrix. The PAHs have a particularly high affinity for soil that contains organic matter (e.g., humic or fulvic substances). PAHs also can naturally attenuate over a long period into less toxic compounds through natural biodegradation. Metals are generally stable in the soil

phase as precipitated, insoluble salts, although they are subject to some leaching and downward migration in infiltrating precipitation.

Where buildings and pavement exist on the Site, soil is not considered a pathway for migration of metals and PAHs because the soils are not subject to potential leaching. These COCs are generally immobile and will not move from the soil phase into either the vapor or aqueous phases. There are limited areas of the Site where soil is exposed and localized leaching can occur. However, due to the depth of groundwater at more than 55 feet below grade, any leaching should not have resulted in contravention of the groundwater AWQSs. The Site groundwater data substantiated this conclusion whereby only one PAH and several naturally-occurring metals (and not COC metals) were detected in Site groundwater above the AWQSs.

Surface water runoff is not considered a potential COC-migration pathway because the pavement and buildings prevent the storm water runoff from contacting impacted soil below ground surface.

Remediation/construction activities may result in generation of dust into the air. Due to their high affinity to soil, both the PAHs and metals can be mobilized and migrate into the air in dust during remedial excavation activities. During remedial excavation activities, a Community Air Monitoring Plan, which is part of the approved IRM Work Plan, will be implemented to minimize potential migration of COCs via air. Soil/fill containing the PAH and metals COCs above their respective RSCOs will be removed during the remedial excavation activities. Hence, there will be no remaining migration pathway from soil to the groundwater or air upon completion of the remediation.

5.2.2 Groundwater

As discussed in Section 4.1.3., PCE and TCE were detected in Site groundwater. In general, both compounds have high volatility and moderate solubility, resulting in the tendency to volatilize from the groundwater into the overlying unsaturated zone soils and migrate as soil vapor. Both PCE and TCE are subject to attenuation in groundwater by advection, dispersion, sorption, and biological degradation. Both compounds are microbially degraded in groundwater through a process known as reductive dehalogenation, which is most prevalent under anaerobic or reducing conditions. The IRM Site Investigation data indicate that groundwater conditions are slightly anaerobic with stabilized pH measured in the IRM wells between about 6.1 and 7.0.

PCE and TCE are liquids in their pure form (at room temperature) and have densities greater than that of water. Therefore, they are classified as dense non-aqueous phase liquids (DNAPLs). A general "rule of thumb" that can indicate the potential presence of DNAPL at a site is if concentrations of the particular COCs are measured in groundwater at or above about 1% of their solubility. The solubility of PCE is 200 mg/L (200,000 ug/L) at 20 degrees C and the solubility of TCE is 1,100 mg/L (1,100,000 ug/L) at 25 degrees C (Perry's Chemical Engineers' Handbook, Sixth Edition by Robert H. Perry and Don Green, 1973, McGraw Hill Publications). Using the "rule of thumb" of 1% solubility for predicting the presence of free product, the critical concentrations of PCE and TCE are then 2,000 ug/L and 11,000 ug/L, respectively. Both

of these concentrations are orders of magnitude above the highest detected concentrations of PCE (96 ug/L) and TCE (20 ug/L) documented in the groundwater database for the entire Atlas Park Site (both Parcels A and B). Consequently, there is no indication that DNAPL is present.

Due to the depth to groundwater, there will be no need for dewatering for any new structures during construction. Therefore, no potential for direct exposure to PCE or TCE in groundwater exists. Therefore, their fate and transport in groundwater was not assessed further.

Some metals (iron, magnesium, manganese, and sodium) were also detected in groundwater at levels above the State AWQSs. However, these analytes are not COCs because they were demonstrated to be naturally occurring in the Site soil. It was concluded that the occurrence of metals in groundwater was due to naturally-occurring conditions.

5.2.3 Soil Vapor

PCE was identified in soil vapor beneath the Site. Because of their relatively high volatility, PCE, and TCE (detected in groundwater), are known to migrate in soil vapors at great distances from a subsurface source (soil or groundwater) through the open pore spaces of the soil matrix. Recent NYSDOH investigations have revealed that vapor plumes may extend laterally significantly beyond the limits of the associated groundwater plumes. Vapors will tend to move laterally and upwards towards the surface, following preferred pathways such as coarse native sand layers and utility backfill material (typically stone or coarse sand).

Building slabs and impermeable cover material (e.g., asphalt, concrete) can act as vertical barriers and impede the venting of soil vapors to the ambient air until the vapor meets a crack or breach in the cover material. In the absence of mitigation measures such as a vapor membrane barrier and/or a sub-slab depressurization system, vapors can migrate into the building spaces through penetrations or cracks in the foundation walls or floors slabs.

Based on the presence of PCE and TCE in groundwater beneath the Site, a screening level assessment was conducted to evaluate the groundwater to indoor air pathway via soil vapor. The current draft NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* was consulted, but it does not provide methods to correlate actual groundwater concentrations to potential soil vapor or indoor air concentrations. However, USEPA has developed guidelines to conduct such screening evaluations to determine if there are potentially unacceptable risks to human health via the "vapor intrusion pathway" (USEPA *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil*). For PCE and TCE, USEPA developed screening levels for cancer risk factors of 10^{-4}, 10^{-5}, and 10^{-6}. Factors of attenuation of the specific compound from the soil or groundwater matrix to indoor air range from 10:1 to 10,000:1. The evaluation is based on generally conservative assumptions, including the presence of penetrations or cracks in the building foundation walls or floors through which volatile constituents can enter the building from the underlying soil and/or groundwater.

A Tier 2 level screening evaluation using the USEPA guidance was completed that involved comparing site data to screening levels developed by USEPA and presented in "look up"

tables. Referring to Table 3C in the guidance, using a cancer risk factor of 10^{-6} and an attenuation factor of 10,000:1, the acceptable target groundwater screening concentration for TCE is 5.0 ug/l and 11 ug/l for PCE. The maximum on-site TCE groundwater concentration was 6.1 ug/l measured at well MW-56 and the maximum PCE was 23 ug/l at well MW-28. These maximum concentrations are above the screening levels. In this case, the guidance indicates that potential risks to building occupants may exist under the conservative assumptions noted, and recommends that additional site-specific analysis be completed such as soil vapor sampling to verify the screening results.

As SVOCs and metals have generally low volatility and a high affinity to remain bound to soil particles, volatilization of SVOCs and metals is expected to be minimal or non-existent currently and during remedial activities.

5.3 Receptor Populations

Human receptors under current (pre-remedial) conditions include Site employees, visitors, demolition workers, and building maintenance, utility, and construction workers that may come in contact with impacted soil that is excavated as part of routine Site maintenance, improvements, or demolition work. During remedial excavation activities, receptors will include on-site remedial and construction workers, and the general public and area residents in off-Site adjacent areas. Under future conditions, potential receptors may include employees and visitors to the basement-level spaces of proposed Buildings 4 and 6.

6.0 EVALUATION OF HUMAN HEALTH EXPOSURE

This section ties together the preceding section (Site conceptual model) with an evaluation of potential human health exposures based on the identified potential exposure pathways. An exposure pathway has the following five elements: 1) a contaminant source; 2) contaminant release and transport mechanism; 3) a point of exposure; 4) a route of exposure (manner in which a COC actually enters or contacts the body); and 5) a receptor population. If any one of these elements is not present, an exposure pathway may be eliminated from further evaluation. If any one or more of the five elements is not documented, a potential exposure pathway exists.

Exposure pathways vary under the current and future conditions. Therefore, both current and future Site conditions were assessed and are discussed separately. Under the current conditions scenario, both pre-remedial/pre-construction conditions and conditions during remediation/construction were evaluated.

6.1 Current Conditions (Pre-remedial/Pre-construction)

Most of the Site is currently paved or covered by buildings, which prevents physical direct exposure to the underlying historic fill under normal operations. However, there is potential for dermal contact and ingestion in several areas of the Site where soil is exposed at the surface. During intrusive work related to maintenance or Site improvements, construction, utility, or maintenance workers may be exposed to impacted soil or dust containing COCs. In addition,

building demolition, including removal of slabs and foundations, was initiated shortly after the IRM Site Investigation was completed, during which time demolition workers could be exposed to the impacted historic fill and dust containing COCs.

Where it is intact, the cover material throughout the Site (e.g., asphalt, concrete) represents a vertical barrier to venting of soil vapors, from impacted groundwater and/or other sources, to the open air. Site workers are not likely to be exposed to unacceptable soil vapor levels during routine Site maintenance or construction activities because soil vapors generally dissipate quickly once they reach outdoor air. Recent NYSDOH investigations at other sites in the state have substantiated these conditions.

Similarly, the building slabs represent vertical barriers to soil vapor intrusion into the existing buildings. Two conditions suggest that vapor intrusion into Site buildings has not occurred to a significant extent. Only limited existing or former buildings contain basement levels (e.g., west end of former Building 3, extreme south end of the Site). In addition, at no time during the IRM Site Investigation or during several UST removals were vapors detected in indoor or ambient air that could be attributable to intrusion from the subsurface. This is supported by the absence of VOCs above the TAGM RSCOs in soil samples collected on the Site.

As the building slabs are removed during demolition and related excavation, any accumulated vapors can freely disperse to the open air. Demolition or remedial workers are not likely to be exposed to soil vapors because the vapors dissipate quickly and workers are generally not in the immediate area when the slabs are removed.

TCE and PCE are present above their respective standards in Site groundwater. Groundwater is located more than 55 feet below ground surface and well below any depth of excavation for Site improvements or maintenance. There is currently no potential for contact by on-Site workers to COCs present in groundwater. In addition, the nearest public supply well is located nearly 2 miles from the Site and reportedly draws water from the deeper Magothy aquifer.

There are no complete exposure pathways for soil, groundwater, or soil vapors, with the exception of potential exposures to maintenance, utility, construction, and demolition workers involved in intrusive activities via dermal contact, ingestion, and inhalation of dust containing COCs.

6.2 Current Conditions (Remedial/Construction Phase)

During remediation and new construction activities at the Site, there will be a potential for exposure to occur to remedial and construction workers via direct contact and ingestion of impacted soil, and inhalation of dust containing COCs.

The proposed remediation and construction activities may result in exposure to the public from dust containing COCs through the off-site migration in air pathway. Nearby residents (i.e., those living along 80th Street and near Doran Avenue) and the public in the area are the primary potential receptors since they will be in proximity to the remedial excavation activities. Visitors to nearby facilities (i.e., the Cemetery and area businesses) could also be exposed to impacted fugitive dust released during the remediation phase. However, their exposure would be occasional and for relatively short periods (e.g., not to exceed generally one to two hours), so their overall potential exposures would be correspondingly low. It should be noted that there

have been no significant detections of VOCs on Site to date, and therefore, potential exposures to vapors is considered minimal.

During construction, potential exposures to Site workers and the public will be managed in accordance with the procedures contained within the RAWP, including the site-specific Health and Safety Plan and Community Air Monitoring Plan. These procedures will include maintaining site security and applying appropriate health and safety measures, such as monitoring the air for organic vapors and dust, dust suppression measures, and wearing the appropriate personal protective equipment (PPE).

Due to the depth to groundwater and because the nearest public supply well is located nearly 2 miles from the Site and reportedly draws water from the deeper Magothy aquifer, there is neither a current nor a future exposure pathway to groundwater COCs. Groundwater will not be encountered during construction activities (i.e., no construction dewatering required) since it occurs at depths far greater than the proposed remediation and construction elevations.

6.3 Future (Post-Construction) Conditions

Site employees and visitors to the proposed development represent a future potential receptor group. However, upon completion of the proposed Parcel A remedial activities, there will be no soils exceeding the TAGM RSCOs remaining on the Site. Therefore, the exposure pathway to impacted soil will be incomplete.

Although groundwater beneath the Site contains VOCs, no on-Site source of VOCs was identified within Parcel A. One soil vapor sample collected on the Site has indicated the presence of VOCs in the soil vapor. Potential exposures could occur via the soil vapor to indoor air pathway in the absence of mitigation measures, specifically for employees and visitors to the basement-level spaces of proposed Buildings 4 and 6.

As a pre-cautionary measure to address potential vapor intrusion, an SSDS will be installed beneath proposed Buildings 4 and 6 (See Figures 9 and 10 for cross-sections through the proposed buildings). The purpose of these systems will be to eliminate the potential exposure pathway between the soil vapor and basement indoor air. The SSDS design is provided in Appendix B.

In conclusion, under the Track 1 cleanup with precautionary soil vapor mitigation, there will be no complete exposure pathways under future conditions. As such, there will be no need to incorporate engineering or institutional controls into the building construction plans.

7.0 ECOLOGICAL RISKS

An evaluation of the ecological risks was performed considering the potential presence of habitats that could support sensitive flora and fauna on the Site and on adjoining properties. The Site is located within an urban area, and is entirely covered by pavement and buildings. This will remain the case after the anticipated construction. Properties surrounding the Site include a cemetery to the north, commercial buildings and private residences to the west and south, and an industrial park to the east. The nearest surface water body, the Ridgewood Reservoir, is located approximately 1.4 miles southwest of the Site. There are no State- or

federal-designated wetlands in proximity to the Site. There are no suitable habitats or natural areas either on Site or near the Site that could potentially support viable natural ecosystems. Therefore, ecological risks are negligible.

8.0 SUMMARY OF HUMAN HEALTH EXPOSURE ASSESSMENT

The human health exposure assessment findings are summarized below based upon an evaluation of the environmental dataset for the Site and a refinement of the conceptual Site model.

8.1 Current Conditions (Pre-remedial/Pre-construction)

Under current (pre-remedial/pre-construction) conditions, maintenance, construction, and demolition workers may be exposed to Site COCs in impacted historic fill that is excavated as part of Site improvements, routine maintenance, and demolition. Associated exposure pathways include dermal contact and ingestion of historic fill and impacted soil, and inhalation of dust containing COCs.

8.2 Current Conditions (Remedial/Construction Phase)

During the remediation activities, human health exposures to Site COCs could occur for construction workers, area residents, and the general public, via direct contact and ingestion (construction workers only), and inhalation of fugitive dust containing COCs (all of the above receptors). Potential exposures can be minimized by following the appropriate health and safety, dust suppression, and site security measures contained within the RAWP including the HASP and the CAMP.

8.3 Future (Post-Construction) Conditions

Upon completion of remediation and building construction, human health exposure pathways to impacted soil will be eliminated since all impacted material will have been removed (Track 1 cleanup).

Under future conditions, potential exposures could occur via the soil vapor intrusion to indoor air pathway in the absence of mitigation. Potential soil vapors will be mitigated by the installation of an SSDS beneath each of Buildings 4 and 6.

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

David T. Gockel, P.E., P.P.
George E. Derrick, P.E.
George P. Kelley, P.E.
Michael A. Semeraro, Jr., P.E.
Nicholas De Rose, P.G.
Andrew J. Ciancia, P.E.
George E. Leventis, P.E.
Rudolph P. Frizzi, P.E.
Ronald A. Fuerst, C.L.A.

Roger A. Archabal, P.E.
Gregory L. Biesiadecki, P.E.
Gerard M. Coscia, P.E.
Colleen Costello, P.G.
Michael E. Cotreau, P.E.
Gregory M. Elko, P.E.
Michael M. Goldstein
Cristina M. González, P.E.
Sam B. Ishak, M.C.S.E.
William G. Lothian, P.E.
John J. McElroy, Jr., Ph.D., P.E.
John D. Plante, P.E.
Alan R. Poeppel, P.E.
Joseph E. Romano, P.L.S.
Leonard D. Savino, P.E.
Steven Ueland, P.E.
Gerald J. Zambrella, C.E.M.

Jorge H. Berkowitz, Ph.D.
Richard Burrow, P.E.
David J. Charette, P.W.S.
Steven Ciambruschini, P.G., L.E.P.
Daniel D. Disario, P.E.
Edward H. Geibert, M.S.
Christopher M. Hager, P.E.
Joel B. Landes, P.E.
Matthew E. Meyer, P.E.
R. S. Murali, M.S.
Richard R. Steiner, P.E.

July 7, 2005

Dawn Hettrick and Chris Doroski
New York State Department of Health
Bureau of Environmental Exposure Investigation
Flanigan Square
547 River Street
Troy, New York 12180-2216

Daniel C. Walsh, Ph.D., Chief and
Vadim Brevdo
New York State Department of
Environmental Conservation
Hazardous Waste & Petroleum Remediation Section
Division of Environmental Remediation
Hunters Point Plaza
47-40 21st Street
Long Island City, New York 11101-5401

Re: Active Sub-slab Depressurization System
The Shops at Atlas Park – Buildings #4 and #6
Glendale, New York
Site No. C241045

Dear Dawn, Chris, Dan and Vadim:

On behalf of Atlas Park, LLC, Langan Engineering & Environmental Services, PC (Langan) is providing for your review and comment our plans and construction drawings for the installation of active sub-slab depressurization (SSD) systems in Buildings #4 and #6 that are currently being constructed at The Shops at Atlas Park development, hereafter referred to as the Site, in Glendale, Queens, New York. As discussed at the last project meeting held on June 15, 2005, despite extensive soil remediation conducted in Parcel A, the SSD systems are being installed as a result of elevated levels of volatile organic compounds (VOCs) in soil vapor samples collected at Parcel A. Specifically, sub-surface soil vapor sampling conducted on May 25, 2005 in the footprint of Buildings #4 and #6 indicated elevated levels of several VOCs including trichloroethene (TCE) and tetrachloroethene (PCE).

As detailed in NYSDOH's draft document entitled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York" (NYSDOH Vapor Guidance), in a normally occupied building, a standard ventilation system may create a pressure differential between the sub-slab space and the building interior that could draw sub-slab vapors into the building. The objective of an SSD system is to actively reverse that pressure differential and thereby prevent vapor intrusion into the building.

The SSD system uses an exhaust fan to evacuate air and create a negative pressure (vacuum) in the sub-slab space.

The installation and design of the SSD systems, the SSD system testing, and the operation, maintenance and monitoring of the systems are described below. The design is based on the NYSDOH Vapor Guidance and EPA Guidance Document EPA/625/R-92/016 concerning sub-slab depressurization of large buildings and schools. Installation of the system is being coordinated with the project architect, structural engineer, and mechanical engineer.

SSD System

The proposed SSD systems will create the required sub-slab vacuum by using a porous sub-slab space to draw soil gas vapor to central suction pits where the vapor will be piped to the roof and exhaust in a manner specifically designed to work in Buildings #4 and #6. The installation of the SSD system includes the following tasks:

- Preparation of the sub-grade
- Sealing conduit and pipe penetrations through the slab and sub-grade walls
- Placement of a sub-slab layer of polyethylene sheeting
- Installation of a series of suction pits
- Installation of electric roof-mounted blower systems to generate the required sub-slab vacuum

The systems are shown on the following attached drawings. Specifications for the installation are contained in the drawing notes and are in general compliance with the NYSDOH Vapor Guidance.

- ***Attachment A: New Construction SSD System Detail Drawing***
  - Drawing DS-3: Sub-slab Depressurization System Detail

- ***Attachment B: Building #4 SSD System Location and Piping***
  - Drawing DS-2: Active Sub-slab Depressurization System - Bldg. 4
  - Drawing 4-DG1.1: Cellar and First Floor Plans (Bldg. 4 Vent Pipe Drawing)
  - Drawing 4-DG1.2: Second Floor and Roof Plans (Bldg. 4 Vent Pipe Drawing)

- ***Attachment C: Building #6 SSD System Location and Piping***
  - Drawing DS-1: Active Sub-slab Depressurization System - Bldg. 6
  - Drawing 6-DG1.0: Basement Plan (Bldg. 6 Vent Pipe Drawing)
  - Drawing 6-DG1.M: Mezzanine Plan (Bldg. 6 Vent Pipe Drawing)
  - Drawing 6-DG1.1: Level 1 Plan (Bldg. 6 Vent Pipe Drawing)
  - Drawing 6-DG1.2: Level 2 Plan (Bldg. 6 Vent Pipe Drawing)
  - Drawing 6-DG1.3: Level 3 Plan (Bldg. 6 Vent Pipe Drawing)
  - Drawing 6-DG1.4: Roof Plan (Bldg. 6 Vent Pipe Drawing)

The calculation for the required air flow for each Suction Pit/Blower system is based on the volume of sub-slab soil and gravel pore space to be affected, an assumed depth of influence of 3.5 feet below the building slab, and four air changes of the pore space volume per day. The calculation for

the required vacuum is based on a required sub-slab vent inlet vacuum pressure of 5 inches of water column (WC), piping losses of 10 inches WC, valve losses of 7 inches WC, pre-filter losses of 7 inches WC, silencer losses of 6 inches WC, for a combined required vacuum at the blower system inlet of 35 inches WC. Given these design requirements, the roof-mounted blower system for Suction Pits #6-1 and #6-2 (combined with a manifold) will provide a minimum of 65 cubic feet per minute (CFM) at 35 inches WC. The blower system for Suction Pit #6-3 will provide a minimum of 180 cubic feet per minute (CFM) at 35 inches WC. The blower system for Suction Pit #4-1 will provide a minimum of 120 cubic feet per minute (CFM) at 35 inches WC.

SSD System Testing

Following installation of the SSD systems, the system tests listed below will be performed:

1. With the depressurization system operating, smoke tubes will be used to check for leaks through conduit and pipe penetrations through the slab and sub-grade walls , and at the suction point. Any leaks identified will be resealed.

2. In buildings where natural draft combustion appliances exist, the building will be tested for backdrafting of the appliances. If necessary, the backdrafting condition will be corrected before the depressurization system is placed in operation.

3. The sub-slab pressure field will be tested by operating the SSD system while observing the movement of smoke downward into small holes (e.g., 3/8 inch) drilled through the slab at sufficient locations to demonstrate that a vacuum is created beneath the entire slab. As an alternative, an evaluation will be performed by using a manometer or comparable instrument. If there is inadequate depressurization pursuant to the NYSDOH guidance document, the source or cause (e.g., improper fan operation) will be identified and corrected. If necessary, the installed blower systems will be upgraded to systems with higher vacuum and air flow in order to achieve the sub-slab vacuum across the building footprint.

4. The warning device indicating blower malfunction will be tested to confirm proper operation.

5. Thirty to ninety days after installation of the system and completion of building construction, indoor and outdoor air sampling will be performed. Samples will be analyzed for the constituents of concern; TCE and PCE.

Operation, Maintenance, and Monitoring (OM&M) Plan

The procedures for operating, maintaining and monitoring the SSD system will be documented in an OM&M plan. Maintenance, as described in the OM&M Plan, will start 18 months following SSD system start-up and again will be performed every 12 to 18 months thereafter. Maintenance will consist of visual inspection of all components of the system, identification and repair of any leaks, changing of blower system filters, and inspection of the exhaust or discharge point to verify that no air intakes are located nearby. As necessary, system components that are

worn, damaged or do not adequately perform the task for which they were designed will be replaced. Air monitoring will not be performed unless the system fails to maintain a vacuum beneath the slab for more than one week.

To avoid delays to the on-going construction, we would appreciate your expeditious review. If at all possible, we would like to discuss the drawings with you this Monday, July 11. We understand that a one day review period is extremely short but we only learned just how far along the slab construction was for these two buildings. In the interim, please call me at 212-479-5404 if you have any questions or comments.

Very truly yours,

Langan Engineering & Environmental Services, P.C.

Joel B. Landes, P.E.
Associate

cc: Damon Hemmerdinger, Mark Powers – Atlas Park, LLC
Linda Shaw – Knauf Shaw LLC (Letter only)

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APPENDIX C

QUALITY ASSURANCE PROJECT PLAN FOR REMEDIAL ACTIVITIES IN PARCEL A (THE FORMER IRM AREA) THE SHOPS AT ATLAS PARK, GLENDALE, NY

Prepared For:

Atlas Park LLC

8000 Cooper Avenue
Glendale, NY 11385

Prepared By:

Langan Engineering and Environmental Services, P.C.
360 West 31st Street
New York, New York 10001

AUGUST 2005

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SECTION 1

PROJECT DESCRIPTION

1.1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) specifies analytical methods to be used to ensure that data from remedial activities, conducted in the Interim Remedial Measures (IRM) Area at the Atlas Park site, Glendale, Queens, New York are precise, accurate, representative, comparable, and complete.

1.2 PROJECT OBJECTIVES

The objectives of this project are to remediate, via excavation and offsite disposal, all soils containing exceedances of NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives (RSCOs), in order to meet Track 1 Objectives as stated in the NYSDEC Brownfield Cleanup Program (BCP).

1.3 SCOPE OF WORK

The specific scope of work for this investigation is described in detail in the Interim Remedial Measures Work Plan (IRMWP), Remedial Investigation Work Plan (RIWP), and Remedial Action Work Plan (RAWP). Samples will be collected from soil stockpiles, test pits, surface soils, soil borings, and soil gas probes. These samples will be analyzed using the USEPA SW-846 "Test Methods for Evaluating Solid Waste," November 1986, 3rd edition (and subsequent updates).

1.4 DATA QUALITY OBJECTIVES AND PROCESSES

The quality assurance and quality control objectives for all measurement data include:

- ***Precision*** – an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Field sampling precision will be determined by analyzing coded duplicate samples and analytical precision will be determined by analyzing internal QC duplicates and matrix spike duplicates.

- ***Accuracy*** – a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern. Sampling accuracy will be determined through the assessment of the analytical results of field blanks and trip blanks for each sample set. Analytical accuracy will be assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), and the percent recoveries of matrix spike compounds added to selected samples and laboratory blanks.

- ***Representativeness*** – expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness will be determined by assessing a number of investigation procedures, including chain of custody, decontamination, and analysis of field blanks and trip blanks.

- ***Completeness*** – the percentage of measurements made which are judged to be valid. Completeness will be assessed through data validation. The QC objective for completeness is generation of valid data for at least 90 percent of the analyses requested.

- ***Comparability*** – expresses the degree of confidence with which one data set can be compared to another. The comparability of all data collected for this project will be ensured using several procedures, including standard methods for both sampling and analysis, instrument calibrations, using standard reporting units and reporting formats, and data validation.

  Each of the above objectives are discussed in detail in Section 3.

SECTION 2

PROJECT ORGANIZATION

The remedial activities will be overseen by Langan for Atlas Park, LLC. Langan will provide on-site field representatives to perform the remedial activity oversight, soil sampling, and soil gas sampling. Langan will also arrange data analysis and reporting tasks. The analytical services will be performed by Severn Trent Laboratories (STL), Long Island Analytical Labs, Inc (LIAL), and Spectrum Analytical Labs, Inc. (Spectrum). Data validation services will be performed by approved data validation contractor(s).

Key contacts for this project are as follows:

Atlas Park LLC Project Manager:	Mr. Damon Hemmerdinger Telephone: (212) 687-5154 Fax: (212) 682-7599
Langan Project Manager:	Mr. Joel Landes, P.E. Telephone: (212) 479-5404 Fax: (212) 479-5444
Langan Technical Manager:	Mr. John Gavras, P.G. Telephone: (212) 479-5406 Fax: (212) 479-5444
Laboratory Representatives:	Severn Trent Laboratories (STL): Kevin Hoogerhyde Telephone: (201) 847-2951 Long Island Analytical Labs Mike Veraldi Telephone: (631) 472-3400 Spectrum Analytical Hannibal Tayeh Telephone: (413) 789-9018

SECTION 3

QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) OBJECTIVES FOR MEASUREMENT OF DATA

3.1 INTRODUCTION

The quality assurance and quality control objectives for all measurement data include precision, accuracy, representativeness, completeness, and comparability. These objectives are defined in following subsections. They are formulated to meet the requirements of the USEPA SW-846. The analytical methods and their Contract Required Quantitation Limits (CRQLs) are given in Section 7.

3.2 PRECISION

Precision is an expression of the reproducibility of measurements of the same parameter under a given set of conditions. Specifically, it is a quantitative measurement of the variability of a group of measurements compared to their average value (USEPA, 1987). Precision is usually stated in terms of standard deviation, but other estimates such as the coefficient of variation (relative standard deviation), range (maximum value minus minimum value), relative range, and relative percent difference (RPD) are common.

For this project, field sampling precision will be determined by analyzing coded duplicate samples (labeled so that the laboratory does not recognize them as duplicates) for the same parameters, and then, during data validation (Section 8), calculating the RPD for duplicate sample results.

Analytical precision will be determined by the laboratory by calculating the RPD for the results of the analysis of internal QC duplicates and matrix spike duplicates. The formula for calculating RPD is as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where:

RPD	=	Relative Percent Difference.
V1, V2	=	The two values to be compared.
$\|V1 - V2\|$	=	The absolute value of the difference between the two values.
$(V1 + V2)/2$	=	The average of the two values.

The data quality objectives for analytical precision, calculated as the RPD between duplicate analyses, are presented in Tables 3.1 and 3.2.

TABLE 3.1
QUALITY CONTROL LIMITS FOR WATER SAMPLES

		Laboratory Accuracy and Precision					
Analytical Parameters	**Analytical Method (a)**	**Matrix Spike (MS) Compounds**	**MS/MSD (b) % Recovery**	**MS/MSD RPD I**	**LCS (d) % Recovery**	**Surrogate Compounds**	**Surrogate % Recovery**
VOCs (e)	8260	1,1-Dichloroethane	61-145	14	NA	Toluene-d8	88-110
		Trichloroethene	71-120	14	NA	Bromofluorobenzene	86-115
		Benzene	76-127	11	NA	1,2-Dichloroethane-d4	76-114
		Toluene	76-125	13	NA		
		Chlorobenzene	75-130	13	NA		
SVOCs (f)	8270	Phenol	12-110	42	NA	Nitrobenzene-d5	35-114
		2-Chlorophenol	27-123	40	NA	2-Fluorobiphenyl	43-116
		1,4-Dichlorobenzene	36-97	28	NA	Terphenyl-d14	33-141
		N-Nitroso-di-n-propylamine	41-116	38	NA	Phenol-d5	10-110
		1,2,4-Trichlorobenzene	39-98	28	NA	2-Fluorophenol	21-110
		4-Chloro-3-methylphenol	23-97	42	NA	2,4,6-Tribromophenol	10-123
		Acenaphthene	46-118	31	NA	2-Chlorophenol-d4	33-110 (g)
		4-Nitrophenol	10-80	50	NA	1,2-Dichlorobenzene-d4	16-110 (g)
		2,4-Dinitrotoluene	24-96	38	NA		
		Pentachlorophenol	9-103	50	NA		
		Pyrene	26-127	31	NA		
Inorganics (i)	6010,7470/7471, 7841,9010, OIA-1677	Inorganic Analyte	75-125 (j)	20 (k)	80-120	NA	NA

(a) Analytical Methods: USEPA SW-846, 3rd edition, Revision 1, November 1990; any subsequent revisions shall supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
(e) Target Compound List Volatile Organic Compounds plus library search
(f) Target Compound List Semivolatile Organic Compounds plus library search
(g) Limits are advisory only
(h) Polychlorinated Biphenyls
(i) Target Analyte List Inorganics (metals)
(j) Matrix spike only
(k) Laboratory duplicate RPD
NA - Not Applicable

TABLE 3.2
QUALITY CONTROL LIMITS FOR SOIL SAMPLES

		Laboratory Accuracy and Precision					
Analytical Parameter	**Analytical Method (a)**	**Matrix Spike (MS) Compounds**	**MS/MSD (b) % Recovery**	**MS/MSD RPD (c)**	**LCS (d) % Recovery**	**Surrogate Compounds**	**Surrogate % Recovery**
VOCs (e)	8260	1,1-Dichloroethane	59-172	22	NA	Toluene-d8	84-138
		Trichloroethene	62-137	24	NA	Bromofluorobenzene	59-113
		Benzene	66-142	21	NA	1,2-Dichloroethane-d4	70-121
		Toluene	59-139	21	NA		
		Chlorobenzene	60-133	21	NA		
SVOCs (f)	8270	Phenol	26-90	35	NA	Nitrobenzene-d5	23-120
		2-Chlorophenol	25-102	50	NA	2-Fluorobiphenyl	30-115
		1,4-Dichlorobenzene	28-104	27	NA	Terphenyl-d14	18-137
		N-Nitroso-di-n-propylamine	41-126	38	NA	Phenol-d5	24-113
		1,2,4-Trichlorobenzene	38-107	23	NA	2-Fluorophenol	25-121
		4-Chloro-3-methylphenol	26-103	33	NA	2,4,6-Tribromophenol	19-122
		Acenaphthene	31-137	19	NA	2-Chlorophenol-d4	20-130 (g)
		4-Nitrophenol	11-114	50	NA	1,2-Dichlorobenzene-d4	20-130 (g)
		2,4-Dinitrotoluene	28-89	47	NA		
		Pentachlorophenol	17-109	47	NA		
		Pyrene	35-142	36	NA		
Inorganics (i)	6010, 7470/7471, 7841, 9010	Inorganic Analyte	75-125 (j)	20 (k)	80-120	NA	NA

(a) Analytical Methods: USEPA SW-846, 3rd edition, Revision 1, November 1990, any subsequent revisions shall supersede this information
(b) Matrix Spike/Matrix Spike Duplicate
(c) Relative Percent Difference
(d) Laboratory Control Sample
(e) Target Compound List Volatile Organic Compounds
(f) Target Compound List Semivolatile Organic Compounds
(g) Limits are advisory only
(h) Polychlorinated Biphenyls
(i) Target Analyte List Inorganics (metals and cyanide)
(j) Matrix spike only
(k) Laboratory duplicate RPD
NA - Not Applicable

3.3 ACCURACY

Accuracy is a measure of the degree of agreement of a measured value with the true or expected value of the quantity of concern (Taylor, 1987), or the difference between a measured value and the true or accepted reference value. The accuracy of an analytical procedure is best determined by the analysis of a sample containing a known quantity of material, and is expressed as the percent of the known quantity which is recovered or measured. The recovery of a given analyte is dependent upon the sample matrix, method of analysis, and the specific compound or element being determined. The concentration of the analyte relative to the detection limit of the analytical method is also a major factor in determining the accuracy of the measurement. Concentrations of analytes which are close to the detection limits are less accurate because they are more affected by such factors as instrument "noise". Higher concentrations will not be as affected by instrument noise or other variables and thus will be more accurate.

Sampling accuracy may be determined through the assessment of the analytical results of field blanks and trip blanks for each sample set. Analytical accuracy is typically assessed by examining the percent recoveries of surrogate compounds that are added to each sample (organic analyses only), and the percent recoveries of matrix spike compounds added to selected samples and laboratory blanks. Additionally, initial and continuing calibrations must be performed and accomplished within the established method control limits to define the instrument accuracy before analytical accuracy can be determined for any sample set.

Accuracy is normally measured as the percent recovery (%R) of a known amount of analyte, called a spike, added to a sample (matrix spike) or to a blank (blank spike). The %R is calculated as follows:

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where:

%R = Percent recovery.

SSR = Spike sample result: concentration of analyte obtained by analyzing the sample with the spike added.

SR = Sample result: the background value, i.e., the concentration of the analyte obtained by analyzing the sample.

SA = Spiked analyte: concentration of the analyte spike added to the sample.

The acceptance limits for accuracy for each parameter are presented in Tables 3.1 and 3.2.

3.4 REPRESENTATIVENESS

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter which is most concerned with the proper design of the sampling program (USEPA, 1987). Samples must be representative of the environmental media being sampled. Selection of sample locations and sampling procedures will incorporate consideration of obtaining the most representative sample possible.

Field and laboratory procedures will be performed in such a manner as to ensure, to the degree that is technically possible, that the data derived represents the in-place quality of the material sampled. Every effort will be made to ensure chemical compounds will not be introduced into the sample via sample containers, handling, and analysis. Decontamination of sampling devices and digging equipment will be performed between samples as outlined in the Field Sampling Plan. Analysis of field blanks, trip blanks, and method blanks will also be performed to monitor for potential sample contamination from field and laboratory procedures.

The assessment of representativeness also must consider the degree of heterogeneity in the material from which the samples are collected. Sampling heterogeneity will be evaluated during data validation through the analysis of coded field duplicate samples. The analytical laboratory will also follow acceptable procedures to assure the samples are adequately homogenized prior to taking aliquots for analysis, so the reported results are representative of the sample received.

Chain-of-custody procedures will be followed to document that contamination of samples has not occurred during container preparation, shipment, and sampling. Details of blank, duplicate and Chain-of-custody procedures are presented in Sections 4 and 5.

3.5 COMPLETENESS

Completeness is defined as the percentage of measurements made which are judged to be valid (USEPA, 1987). The QC objective for completeness is generation of valid data for at least 90 percent of the analyses requested. Completeness is defined as follows for all sample measurements:

$$\%C = \frac{V}{T} \times 100$$

where:

%C = Percent completeness.

V = Number of measurements judged valid.

T = Total number of measurements.

3.6 COMPARABILITY

Comparability expresses the degree of confidence with which one data set can be compared to another (USEPA, 1987). The comparability of all data collected for this project will be ensured by:

- Using identified standard methods for both sampling and analysis phases of this project;
- Requiring traceability of all analytical standards and/or source materials to the U.S. Environmental Protection Agency (USEPA) or National Institute of Standards and Technology (NIST);
- Requiring that all calibrations be verified with an independently prepared standard from a source other than that used for calibration (if applicable);
- Using standard reporting units and reporting formats including the reporting of QC data;
- Performing a complete data validation on a representative fraction of the analytical results, including the use of data qualifiers in all cases where appropriate; and
- Requiring that all validation qualifiers be used any time an analytical result is used for any purpose.

These steps will ensure all future users of either the data or the conclusions drawn from them will be able to judge the comparability of these data and conclusions.

SECTION 4

SAMPLING PROGRAM

4.1 INTRODUCTION

The sampling program will provide data concerning the presence and the nature and extent of contamination of soil and groundwater, if any. This section presents sample container preparation procedures, sample preservation procedures, sample holding times, and field QC sample requirements. Sample locations, and the number of environmental and QC samples to be taken are given in Table 4.1. The sampling procedures are presented in the Remedial Action Work Plan (RAWP).

4.2 SAMPLE CONTAINER PREPARATION AND SAMPLE PRESERVATION

Sample containers will be properly washed and decontaminated prior to their use by either the analytical laboratory or the container vendor to the specifications required by the USEPA. Copies of the sample container QC analyses will be provided by the laboratory for each container lot used to obtain samples. The containers will be tagged, the appropriate preservatives will be added. The types of containers are shown in Tables 4.2 and 4.3.

Samples shall be preserved according to the preservation techniques given in Tables 4.2 and 4.3. Preservatives will be added to the sample bottles by the laboratory prior to their shipment in sufficient quantities to ensure that proper sample pH is met. Following sample collection, the sample bottles should be placed on ice in the shipping cooler, cooled to $4^{\circ}C$ with ice or "blue ice", and delivered to the laboratory within 48 hours of collection. Chain-of-custody procedures are described in Section 7.

4.3 SAMPLE HOLDING TIMES

The sample holding times for organic and inorganic parameters are given in Tables 4.2 and 4.3 and must be in accordance with the NYSDEC ASP requirements. The NYSDEC ASP holding times must be strictly adhered to by the laboratory. Any holding time exceedances must be reported to Atlas Park.

4.4 FIELD QC SAMPLES

To assess field sampling and decontamination performance, two types of "blanks" will be collected and submitted to the laboratory for analyses. In addition, the precision of field sampling procedures will be assessed by collecting coded field duplicates and matrix spike/matrix spike duplicates (MS/MSDs). The blanks will include:

The duplicates will consist of:

a. Coded Field Duplicate - To determine the representativeness of the sampling methods, coded field duplicates will be collected. The samples are termed "coded" because they will be labeled in such a manner that the laboratory will not be able to determine that they are a duplicate sample. This will eliminate any possible bias that could arise.

b. Matrix Spike/Matrix Spike Duplicate (MS/MSD) - MS/MSD samples (MS/MSD for organics; MS and laboratory duplicate for inorganics) will be taken at a frequency of one pair per 20 field samples. These samples are used to assess the effect of the sample matrix on the recovery of target compounds or target analytes. The percent recoveries and RPDs are given in Tables 3.1 and 3.2.

TABLE 4.2

WATER SAMPLE CONTAINERIZATION, PRESERVATION, AND HOLDING TIMES

Analysis	Bottle Type	Preservation (a)	Holding Time (b)
Volatile Organic Compounds (VOCs)	2-40 mL glass vial w/ Teflon septum	Cool to 4°C	10 days
Semivolatile Organics Compounds (SVOCs)	1000 mL glass w/ Teflon lined cap	Cool to 4°C	5 days*
Metals	1000 mL plastic bottle	Nitric Acid to pH < 2 Cool to 4°C	6 months, except mercury (26 days)

(a) All samples to be preserved in ice during collection and transport.

(b) Days from validated time of sample receipt (VTSR).

* Continuous liquid-liquid extraction is the required extraction for water samples for SVOCs. Continuous liquid-liquid extraction and concentration of water samples for SVOCs analysis completed within 7 days of VTSR. Extracts of water samples must be analyzed within 40 days of extraction.

TABLE 4.3

SOIL SAMPLE CONTAINERIZATION AND HOLDING TIMES

Analysis	Bottle Type	Preservation [a]	Holding Time [b]
Volatile Organic Compounds (VOCs)	Wide-mouth glass w/ teflon lined cap	Cool to 4°C	10 days
Other Organic Compounds [c]	Wide-mouth glass w/ teflon lined cap	Cool to 4°C	10 days*
Metals	Wide-mouth plastic or glass	Cool to 4°C	6 months, except mercury (26 days)

(a) All samples to be preserved in ice during collection and transport.
(b) Days from date of sample collection.
(c) Semivolatile organic compounds or PCBs.
* Sohxlet or sonication procedures for extraction and concentration of soil/waste samples for SVOCs must be completed within 10 days of VTSR. Extracts of soil samples must be analyzed within 40 days of extraction.

SECTION 5

SAMPLE TRACKING AND CUSTODY

5.1 INTRODUCTION

This section presents sample custody procedures for both the field and laboratory. Implementation of proper custody procedures for samples generated in the field is the responsibility of field personnel. Both laboratory and field personnel involved in the Chain-of-custody (COC) and transfer of samples will be trained as to the purpose and procedures prior to implementation.

Evidence of sample traceability and integrity is provided by COC procedures. These procedures document the sample traceability from the selection and preparation of the sample containers by the laboratory, to sample collection, to sample shipment, to laboratory receipt and analysis. The sample custody flowchart is shown in Figure 5.1. A sample is considered to be in a person's custody if the sample is:

- In a person's possession;
- Maintained in view after possession is accepted and documented;
- Locked and tagged with Custody Seals so that no one can tamper with it after having been in physical custody; or
- In a secured area which is restricted to authorized personnel.

5.2 FIELD SAMPLE CUSTODY

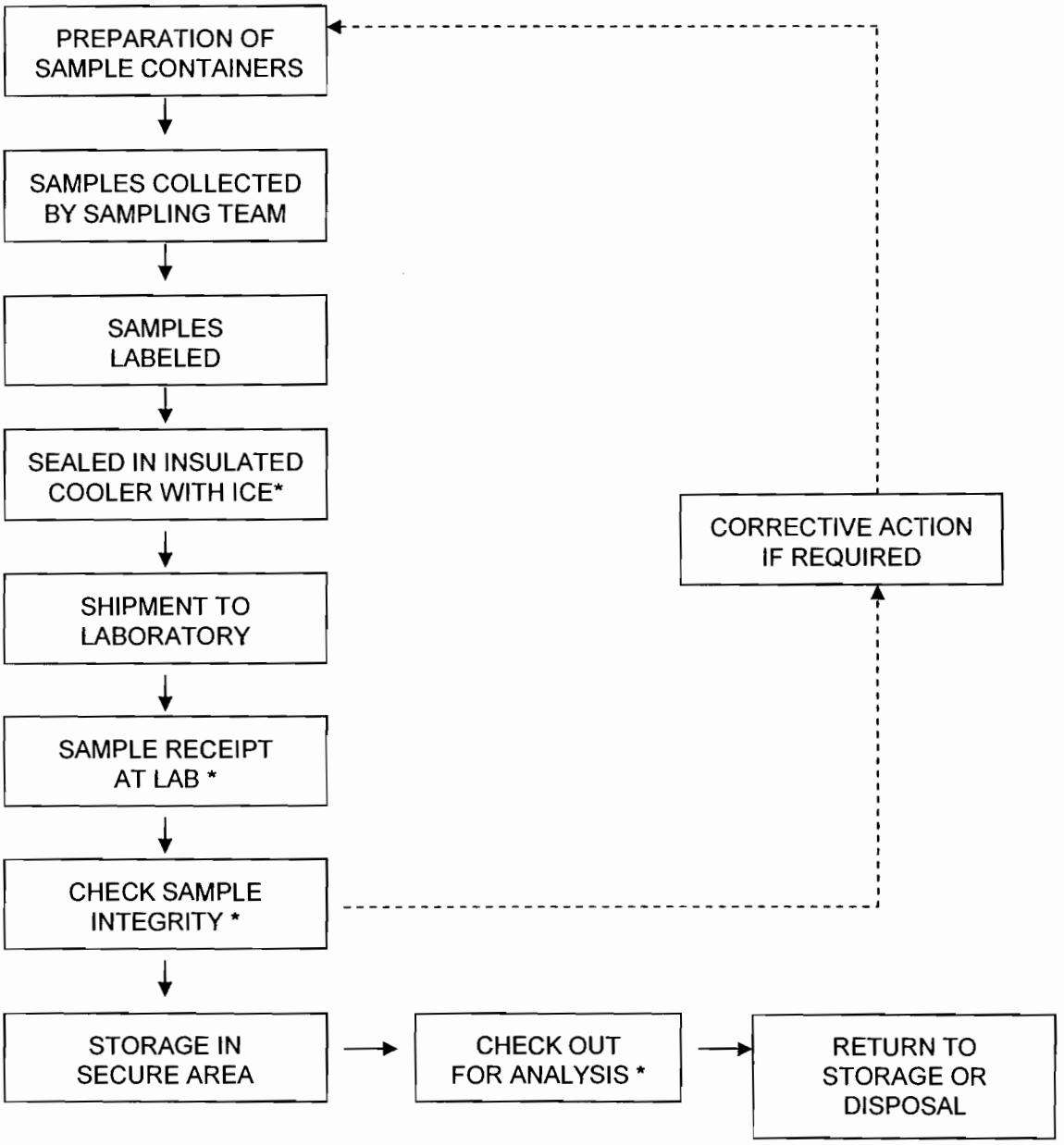
A COC record (Figure 5.2 or similar) accompanies the sample containers from selection and preparation at the laboratory, during shipment to the field for sample containment and preservation, and during return to the laboratory. Triplicate copies of the COC must be completed for each sample set collected.

The COC lists the field personnel responsible for taking samples, the project name and number, the name of the analytical laboratory to which the samples are sent, and the method of sample shipment. The COC also lists a unique description of every sample bottle in the set. If samples are split and sent to different laboratories, a copy of the COC record will be sent with each sample.

The REMARKS space on the COC is used to indicate if the sample is a matrix spike, matrix spike duplicate, or any other sample information for the laboratory. Since they are not specific to any one sample point, trip and field blanks are indicated on separate rows. Once all bottles are properly accounted for on the form, a sampler will write his or her signature and the date and time on the first RELINQUISHED BY space. The sampler will also write the method of shipment, the shipping cooler identification number, and the

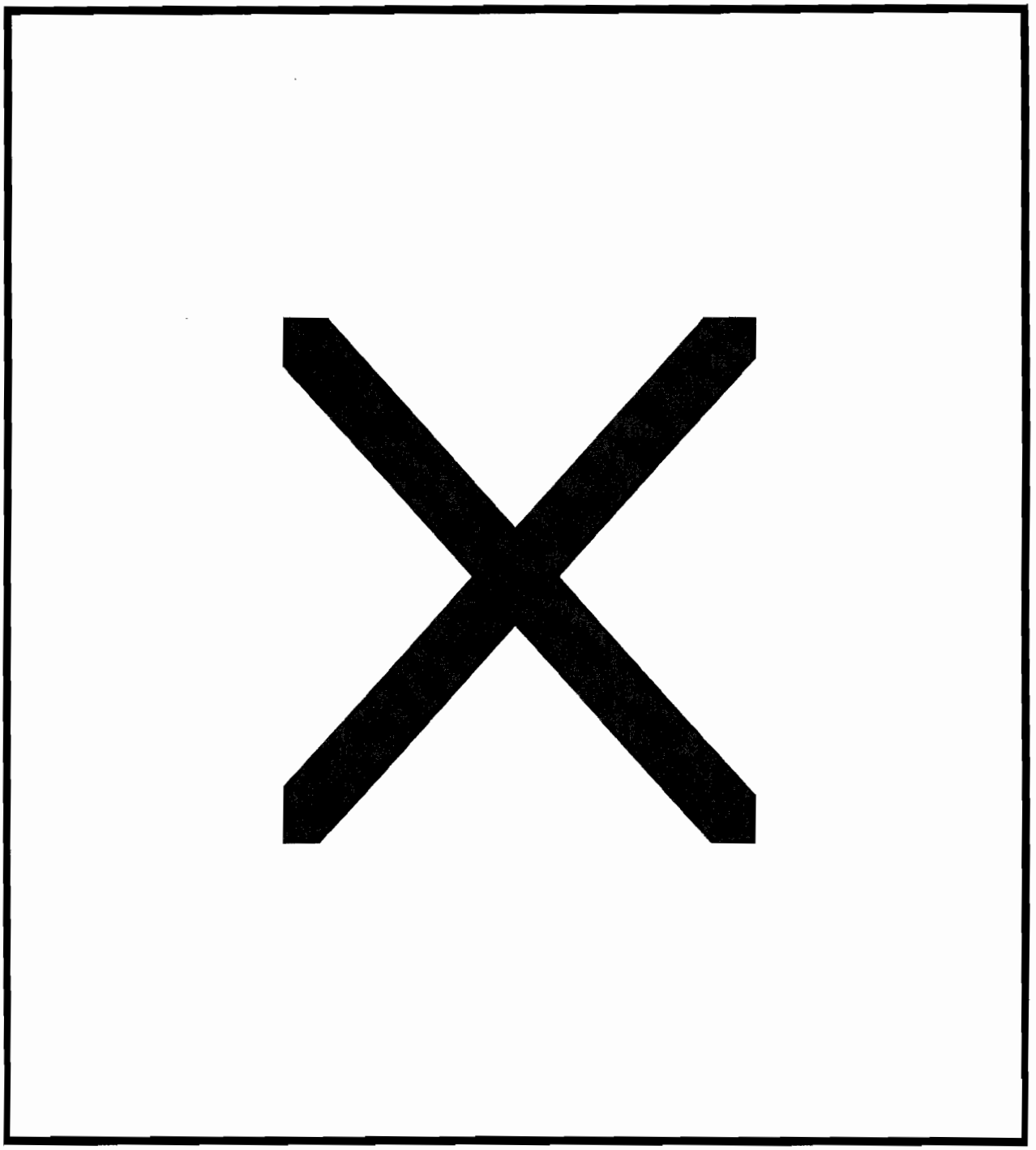
FIGURE 5.1

SAMPLE CUSTODY



* REQUIRES SIGN-OFF ON CHAIN-OF-CUSTODY FORM

Figure 5.2 Chain-of-Custody Record



shipper airbill number on the top of the COC. Mistakes will be crossed out with a single line in ink and initialed by the author.

One copy of the COC is retained by sampling personnel (notations identifying blind duplicate samples will be added to this copy of the COC but not the others that will go to the laboratory) and the other two copies are put into a sealable plastic bag and taped inside the lid of the shipping cooler. The cooler lid is closed, custody seals provided by the laboratory are affixed to the latch and across the back and front lids of the cooler, and the person relinquishing the samples signs their name across the seal. The seal is taped, and the cooler is wrapped tightly with clear packing tape. It is then relinquished by field personnel to personnel responsible for shipment, typically an overnight carrier. The COC seal must be broken to open the container. Breakage of the seals before receipt at the laboratory may indicate tampering. If tampering is apparent, the laboratory will contact the Project Manager, and the sample will not be analyzed.

5.3 LABORATORY SAMPLE CUSTODY

The Project Manager or Field Team Leader will notify the laboratory of upcoming field sampling activities, and the subsequent shipment of samples to the laboratory. This notification will include information concerning the number and type of samples to be shipped as well as the anticipated date of arrival.

The following laboratory sample custody procedures will be used:

- The laboratory will designate a sample custodian who will be responsible for maintaining custody of the samples, and for maintaining all associated records documenting that custody.
- Upon receipt of the samples, the custodian will check cooler temperature, and check the original COC documents and compare them with the labeled contents of each sample container for correctness and traceability. The sample custodian will sign the COC record and record the date and time received.
- Care will be exercised to annotate any labeling or descriptive errors. In the event of discrepant documentation, the laboratory will immediately contact the Project Manager or Field Team Leader as part of the corrective action process. A qualitative assessment of each sample container will be performed to note any anomalies, such as broken or leaking bottles. This assessment will be recorded as part of the incoming chain-of-custody procedure.
- The samples will be stored in a secured area at a temperature of approximately 4 degrees Celsius until analyses commence.
- A laboratory tracking record will accompany the sample or sample fraction through final analysis for control.
- A copy of the tracking record will accompany the laboratory report and will become a permanent part of the project records.

SECTION 6

CALIBRATION PROCEDURES

6.1 FIELD INSTRUMENTS

All field analytical equipment will be calibrated immediately prior to each day's use. The calibration procedures will conform to manufacturer's standard instructions and are described in the Field Sampling Plan. This calibration will ensure that the equipment is functioning within the allowable tolerances established by the manufacturer and required by the project. Records of all instrument calibration will be maintained by the Field Team Leader. Copies of all the instrument manuals will be maintained on-site by the Field Team Leader.

Calibration procedures for instruments used for monitoring health and safety hazards (e.g., photoionization detector and explosimeter) are provided in the Health and Safety Plan.

6.2 LABORATORY INSTRUMENTS

The laboratory will follow all calibration procedures and schedules as specified in the sections of the USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods given in Section 7.

SECTION 7

ANALYTICAL PROCEDURES

7.1 INTRODUCTION

Samples will be analyzed according to the USEPA SW-846 "Test Methods for Evaluating Solid Waste," November 1986, 3rd edition and subsequent updates. The methods to be used for the laboratory analysis of water and soil samples are presented in Table 7.1. These methods were selected because they attain the quantitation limits which are compiled on Table 7.1.

TABLE 7.1

PROJECT QUANTITATION LIMITS

	Analysis/Compound	Method	Quantitation Limits Water (ug/L)	Quantitation Limits Soil (ug/kg)	State of New York Standards Water (ug/L) [a]	State of New York Standards Soil (ug/kg) [b]
	Volatile Organics					
1	1,1,1-Trichloroethane	SW8260B	1	5	5	800
2	1,1,2,2-Tetrachloroethane	SW8260B	1	5	5	600
3	1,1,2-Trichloroethane	SW8260B	1	5	1	
4	1,1-Dichloroethane	SW8260B	1	5	5	200
5	1,1-Dichloroethene	SW8260B	1	5	5	400
6	1,2-Dichloroethane	SW8260B	1	5	0.6	100
7	1,2-Dichloroethene(total)	SW8260B	1	5	5	300
8	1,2-Dichloropropane	SW8260B	1	5	1	
9	2-Butanone (MEK)	SW8260B	10	20		300
10	2-Hexanone	SW8260B	10	20		
11	4-Methyl-2-pentanone(MIBK)	SW8260B	5	20		1000
12	Acetone	SW8260B	10	20		200
13	Benzene	SW8260B	1	5	1	60
14	Bromodichloromethane	SW8260B	1	5		
15	Bromoform	SW8260B	1	5		
16	Bromomethane	SW8260B	2	10	5	
17	Carbon Disulfide	SW8260B	1	5		2700
18	Carbon Tetrachloride	SW8260B	1	5	5	600
19	Chlorobenzene	SW8260B	1	5	5	1700
20	Chloroethane	SW8260B	2	10	5	1900
21	Chloroform	SW8260B	1	5	7	300
22	Chloromethane	SW8260B	2	10	5	
23	cis-1,3-Dichloropropene	SW8260B	1	5	0.4	
24	Dibromochloromethane	SW8260B	1	5	5	
25	Ethyl Benzene	SW8260B	1	5	5	5500
26	Methylene Chloride	SW8260B	1	5	5	100
27	Styrene	SW8260B	1	5	5	
28	Tetrachloroethene	SW8260B	1	5	5	1400
29	Toluene	SW8260B	1	5	5	1500
30	trans-1,3-Dichloropropene	SW8260B	1	5	0.4	
31	Trichloroethene	SW8260B	1	5	5	700
32	Vinyl Chloride	SW8260B	2	10	2	200
33	Xylenes (total)	SW8260B	1	5	5	1200

TABLE 7.1 (Continued)

PROJECT QUANTITATION LIMITS

	Analysis/Compound	Method	Quantitation Limits		State of New York Standards	
			Water (ug/L)	Soil (ug/kg)	Water (ug/L)	Soil (ug/kg)
	Semivolatile Organics					
1	1,2,4-Trichlorobenzene	SW8270C	10	330	5	3400
2	1,2-Dichlorobenzene	SW8270C	10	330	3	7900
3	1,3-Dichlorobenzene	SW8270C	10	330	3	1600
4	1,4-Dichlorobenzene	SW8270C	10	330	3	8500
5	2,2'-oxybis(1-chloropropane)*	SW8270C	10	330	5	
6	2,4,5-Trichlorophenol	SW8270C	25	330	1	100
7	2,4,6-Trichlorophenol	SW8270C	10	330	1	
8	2,4-Dichlorophenol	SW8270C	10	330	1	400
9	2,4-Dimethylphenol	SW8270C	10	330	1	
10	2,4-Dinitrophenol	SW8270C	25	330	1	200
11	2,4-Dinitrotoluene	SW8270C	10	330	5	
12	2,6-Dinitrotoluene	SW8270C	10	330	5	1000
13	2-Chloronaphthalene	SW8270C	10	330		
14	2-Chlorophenol	SW8270C	10	330	1	800
15	2-methyl-4,6-Dinitrophenol	SW8270C	25	330		
16	2-Methylnaphthalene	SW8270C	10	330		36400
17	2-Methylphenol	SW8270C	10	330	1	100
18	2-Nitrolaniline	SW8270C	25	330	5	430
19	2-Nitrophenol	SW8270C	10	330	1	330
20	3,3'-Dichlorobenzidine	SW8270C	10	330	5	
21	3-Nitroaniline	SW8270C	25	330	5	500
22	4-Bromophenyl-phenyl ether	SW8270C	10	330		
23	4-Chloro-3-methylphenol	SW8270C	10	330		240
24	4-Chloroaniline	SW8270C	10	330	5	220
25	4-Chlorophenyl-phenyl ether	SW8270C	10	330		
26	4-Methylphenol	SW8270C	10	330	1	900
27	4-Nitroaniline	SW8270C	25	330	5	
28	4-Nitrophenol	SW8270C	25	330	1	100
29	Acenaphthene	SW8270C	10	330		50000
30	Acenaphthylene	SW8270C	10	330		41000
31	Anthracene	SW8270C	10	330		50000
32	Benzo(a)anthracene	SW8270C	10	330		224
33	Benzo(a)pyrene	SW8270C	10	330		61
34	Benzo(b)fluoranthene	SW8270C	10	330		1100

TABLE 7.1 (Continued)
PROJECT QUANTITATION LIMITS

	Analysis/Compound	Method	Quantitation Limits		State of New York Standards	
			Water (ug/L)	Soil (ug/kg)	Water (ug/L)	Soil (ug/kg)
	Semivolatile Organics, cont.					
35	Benzo(g,h,i)perylene	SW8270C	10	330		50000
36	Benzo(k)fluoranthene	SW8270C	10	330		1100
37	bis(2-Chloroethoxy) methane	SW8270C	10	330	5	
38	bis(2-Chloroethyl) ether	SW8270C	10	330	1	
39	bis(2-ethylhexyl)phthalate	SW8270C	10	330	5	50000
40	Butylbenzylphthalate	SW8270C	10	330		50000
41	Carbazole	SW8270C	10	330		
42	Chrysene	SW8270C	10	330		400
43	Di-n-butylphthalate	SW8270C	10	330	50	8100
44	Di-n-octylphthalate	SW8270C	10	330		50000
45	Dibenz(a,h)anthracene	SW8270C	10	330		14
46	Dibenzofuran	SW8270C	10	330		6200
47	Diethylphthalate	SW8270C	10	330		7100
48	Dimethylphthalate	SW8270C	10	330		2000
49	Fluoranthene	SW8270C	10	330		50000
50	Fluorene	SW8270C	10	330		50000
51	Hexachlorobenzene	SW8270C	NA (8081A)	330		410
52	Hexachlorobutadiene	SW8270C	10	330	0.5	
53	Hexachlorocyclopentadiene	SW8270C	10	330	5	
54	Hexachloroethane	SW8270C	10	330	5	
55	Indeno(1,2,3-cd)pyrene	SW8270C	10	330		3200
56	Isophorone	SW8270C	10	330		4400
57	N-Nitroso-di-n-propylamine	SW8270C	10	330		
58	N-nitrosodiphenylamine	SW8270C	10	330		
59	Naphthalene	SW8270C	10	330		13000
60	Nitrobenzene	SW8270C	10	330	0.4	200
61	Pentachlorophenol	SW8270C	25	330	1	1000
62	Phenanthrene	SW8270C	10	330		50000
63	Phenol	SW8270C	10	330	1	30
64	Pyrene	SW8270C	10	330		50000

TABLE 7.1 (Continued)
PROJECT QUANTITATION LIMITS

	Analysis/Compound	Method	Estimated Quantitation Limits Water (ug/L)	Estimated Quantitation Limits Soil (ug/kg)	State of New York Standards Water (ug/L)	State of New York Standards Soil (ug/kg)
	PCBs					
1	Aroclor-1016	SW8082	1.0	33	0.09	1000
2	Aroclor-1221	SW8082	2.0	33	0.09	1000
3	Aroclor-1232	SW8082	1.0	33	0.09	1000
4	Aroclor-1242	SW8082	1.0	33	0.09	1000
5	Aroclor-1248	SW8082	1.0	33	0.09	1000
6	Aroclor-1254	SW8082	1.0	33	0.09	1000
7	Aroclor-1260	SW8082	1.0	33	0.09	1000
	Metals		**(mg/L)**	**(mg/kg)**	**(mg/L)**	**(mg/kg)**
1	Antimony	SW6010B	0.006	5.0	0.003	
2	Arsenic	SW6010B	0.01	1	0.025	7.5
3	Barium	SW6010B	0.01	1	1	300
4	Beryllium	SW6010B	0.005	0.5	0.003	0.16
5	Cadmium	SW6010B	0.005	0.5	0.005	1
6	Chromium	SW6010B	0.01	1	0.05	10
7	Copper	SW6010B	0.03	2.5	0.2	25
8	Lead	SW6010B	0.01	0.5	0.025	400[(c)]
9	Mercury	SW7470A/7471A	0.0002	0.01	0.0007	0.1
10	Nickel	SW6010B	0.04	4	0.1	13
11	Selenium	SW6010B	0.01	1	0.01	2
12	Silver	SW6010B	0.01	1	0.05	
13	Thallium	SW7841	0.002	1	0.0005	
14	Zinc	SW6010B	0.02	2	2	20
15	Vanadium	SW6010B	0.05	1	0.0005	150
16	Cobalt	SW6010B	0.05	1		30
17	Aluminum	SW6010B	0.2	20		
18	Calcium	SW6010B	5	500		
19	Iron	SW6010B	0.1	10	0.3	2000

TABLE 7.1 (Continued)
PROJECT QUANTITATION LIMITS

Analysis/Compound	Method	Estimated Quantitation Limits		State of New York Standards	
		Water (mg/L)	Soil (mg/kg)	Water (mg/L)	Soil (mg/kg)
Metals, cont.					
20 Magnesium	SW6010B	5	500	35	
21 Manganese	SW6010B	0.015	1.5	0.3	
22 Potassium	SW6010B	5	500		
23 Sodium	SW6010B	5	500	20	

Notes:
N/A Not Applicable
(a) Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, NYSDEC, October 1993
(b) Determination of Soil Cleanup Objectives and Cleanup Levels, NYSDEC, January 24, 1994
(c) EPA Guidance on Residential Lead-Based Paint, Lead Contaminated Dust, and Lead Contaminated Soil, July 14, 1994

SECTION 8

DATA REDUCTION, VALIDATION, AND REPORTING

8.1 INTRODUCTION

Data collected during the field investigation will be reduced and reviewed by the laboratory QA personnel, and a report on the findings will be tabulated in a standard format. The criteria used to identify and quantify the analytes will be those specified for the applicable methods in the USEPA SW-846 and subsequent updates. The data package provided by the laboratory will contain all items specified in the USEPA SW-846 appropriate for the analyses to be performed, and be reported in standard format.

The completed copies of the Chain-of-custody records (both external and internal) accompanying each sample from time of initial bottle preparation to completion of analysis shall be attached to the analytical reports.

8.2 DATA REDUCTION

Two copies of the analytical data packages and an electronic disk deliverable will be provided by the laboratory approximately 30 days after receipt of a complete sample delivery group. The Project Manager will immediately arrange for filing one package; a second copy, and the disk deliverable, will be used to generate summary tables. These tables will form the database for assessment of the site contamination condition.

Each diskette deliverable must be formatted and copied using an MS-DOS operating system. To avoid transcription errors, data will be loaded directly into the ASCII format from the laboratory information management system (LIMS). If this can not be accomplished, the consultant should be notified via letter of transmittal indicating that manual entry of data is required for a particular method of analysis. All diskette deliverables must also undergo a QC check by the laboratory before delivery. The original data, tabulations, and electronic media are stored in a secure and retrievable fashion.

The Project Manager or Task Manager will maintain close contact with the QA reviewer to ensure all non-conformance issues are acted upon prior to data manipulation and assessment routines. Once the QA review has been completed, the Project Manager may direct the Team Leaders or others to initiate and finalize the analytical data assessment.

8.3 DATA VALIDATION

Data validation will be performed in accordance with the USEPA validation guidelines for organic and inorganic data review. Validation will include the following:

- Verification of 100% of all QC sample results (both qualitative and quantitative),
- Verification of the identification of 100% of all applicable sample results (both positive hits and non-detects),
- Recalculation of 10% of all investigative sample results, and
- Data Usability Summary Report (DUSR).

A DUSR will be prepared and reviewed by the PQAM before issuance. The DUSR will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and COC procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method. A detailed assessment of each SDG will follow. For each of the organic analytical methods, the following will be assessed:

- Holding times;
- Instrument tuning;
- Instrument calibrations;
- Blank results;
- System monitoring compounds or surrogate recovery compounds (as applicable);
- Internal standard recovery results;
- MS and MSD results;
- Target compound identification;
- Chromatogram quality;
- Pesticide cleanup (if applicable);
- Compound quantitation and reported detection limits;
- System performance; and
- Results verification.

For each of the inorganic compounds, the following will be assessed:

- Holding times;
- Calibrations;
- Blank results;

- Interference check sample;
- Laboratory check samples;
- Duplicates;
- Matrix Spike;
- Furnace atomic absorption analysis QC;
- ICP serial dilutions; and
- Results verification and reported detection limits.

Based on the results of data validation, the validated analytical results reported by the laboratory will be assigned one of the following usability flags:

- "U" - Not detected at given value;
- "UJ" - Estimated not detected at given value;
- "J" - Estimated value;
- "N" – Presumptive evidence at the value given;
- "R" - Result not useable; and
- No Flag - Result accepted without qualification.

SECTION 9

INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

9.1 QUALITY ASSURANCE BATCHING

Each set of samples will be analyzed concurrently with calibration standards, method blanks, matrix spikes (MS), matrix spike duplicates (MSD) or laboratory duplicates, and QC check samples (if required by the protocol). The MS/MSD samples will be designated by the field personnel. If no MS/MSD samples have been designated, the laboratory will contact the Langan Project Manager for corrective action.

9.2 CALIBRATION STANDARDS AND SURROGATES

All organic standard and surrogate compounds are checked by the method of mass spectrometry for correct identification and gas chromatography for degree of purity and concentration. All standards are traceable to a source of known quality certified by the USEPA or NIST, or other similar program. When the compounds pass the identity and purity tests, they are certified for use in standard and surrogate solutions. Concentrations of the solutions are checked for accuracy before release for laboratory use. Standard solutions are replaced monthly or more frequently, based upon data indicating deterioration.

9.3 ORGANIC BLANKS AND MATRIX SPIKE

Analysis of blank samples verifies that the analytical method does not introduce contaminants or detect "false positives". The blank water can be generated by reverse osmosis and Super-Q filtration systems, or distillation of water containing $KMnO_4$. The matrix spike is generated by addition of surrogate standard to each sample.

9.4 TRIP AND FIELD BLANKS

Trip blanks and field blanks will be utilized in accordance with the specifications in Section 4. These blanks will be analyzed to provide a check on sample bottle preparation and to evaluate the possibility of atmospheric or cross contamination of the samples.

SECTION 10

QUALITY ASSURANCE PERFORMANCE AUDITS AND SYSTEM AUDITS

10.1 INTRODUCTION

Quality assurance audits may be performed by the project quality assurance group under the direction and approval of the PQAM. These audits will be implemented to evaluate the capability and performance of project and subcontractor personnel, items, activities, and documentation of the measurement system(s). Functioning as an independent body and reporting directly to corporate quality assurance management, the PQAM may plan, schedule, and approve system and performance audits based upon procedures customized to the project requirements. At times, the PQAM may request additional personnel with specific expertise from company and/or project groups to assist in conducting performance audits. However, these personnel will not have responsibility for the project work associated with the performance audit.

10.2 SYSTEM AUDITS

System audits may be performed by the PQAM or designated auditors, and encompass a qualitative evaluation of measurement system components to ascertain their appropriate selection and application. In addition, field and laboratory quality control procedures and associated documentation may be system audited. These audits may be performed once during the performance of the project. However, if conditions adverse to quality are detected or if the Project Manager requests, additional audits may occur.

10.3 PERFORMANCE AUDITS

The laboratory may be required to conduct an analysis of Performance Evaluation (PE) samples or provide proof that Performance Evaluation samples submitted by USEPA or a state agency have been analyzed within the past twelve months.

10.4 FORMAL AUDITS

Formal audits refer to any system or performance audit that is documented and implemented by the QA group. These audits encompass documented activities performed by qualified lead auditors to a written procedure or checklists to objectively verify that quality assurance requirements have been developed, documented, and instituted in accordance with contractual and project criteria. Formal audits may be performed on project and subcontractor work at various locations.

Audit reports will be written by auditors who have performed the site audit after gathering and evaluating all data. Items, activities, and documents determined by lead

auditors to be in noncompliance shall be identified at exit interviews conducted with the involved management. Noncompliances will be logged, and documented through audit findings which are attached to and are a part of the integral audit report. These audit finding forms are directed to management to satisfactorily resolve the noncompliance in a specified and timely manner.

The Project Manager has overall responsibility to ensure that all corrective actions necessary to resolve audit findings are acted upon promptly and satisfactorily. Audit reports must be submitted to the Project Manager within fifteen days of completion of the audit. Serious deficiencies will be reported to the Project Manager within 24 hours. All audit checklists, audit reports, audit findings, and acceptable resolutions are approved by the PQAM prior to issue. Verification of acceptable resolutions may be determined by re-audit or documented surveillance of the item or activity. Upon verification acceptance, the PQAM will close out the audit report and findings.

SECTION 11

PREVENTIVE MAINTENANCE PROCEDURES AND SCHEDULES

11.1 PREVENTIVE MAINTENANCE PROCEDURES

Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedure developed by the operators.

A list of critical spare parts will be established by the operator. These spare parts will be available for use in order to reduce the downtime. A service contract for rapid instrument repair or backup instruments may be substituted for the spare part inventory.

11.2 SCHEDULES

Written procedures will establish the schedule for servicing critical items in order to minimize the downtime of the measurement system. The laboratory will adhere to the maintenance schedule, and arrange any necessary and prompt service. Required service will be performed by qualified personnel.

11.3 RECORDS

Logs shall be established to record and control maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Records produced shall be reviewed, maintained, and filed by the operators at the laboratories. The PQAM may audit these records to verify complete adherence to these procedures.

SECTION 12

CORRECTIVE ACTION

12.1 INTRODUCTION

The following procedures have been established to ensure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected.

12.2 PROCEDURE DESCRIPTION

When a significant condition adverse to quality is noted at site, laboratory, or subcontractor location, the cause of the condition will be determined and corrective action will be taken to preclude repetition. Condition identification, cause, reference documents, and corrective action planned to be taken will be documented and reported to the PQAM, Project Manager, Field Team Leader and involved contractor management, at a minimum. Implementation of corrective action is verified by documented follow-up action.

All project personnel have the responsibility, as part of the normal work duties, to promptly identify, solicit approved correction, and report conditions adverse to quality. Corrective actions will be initiated as follows:

- When predetermined acceptance standards are not attained;
- When procedure or data compiled are determined to be deficient;
- When equipment or instrumentation is found to be faulty;
- When samples and analytical test results are not clearly traceable;
- When quality assurance requirements have been violated;
- When designated approvals have been circumvented;
- As a result of system and performance audits;
- As a result of a management assessment;
- As a result of laboratory/field comparison studies; and
- As required by USEPA SW-846, and subsequent updates, or by the NYSDEC ASP.

Project management and staff, such as field investigation teams, remedial response planning personnel, and laboratory groups, monitor on-going work performance in the normal course of daily responsibilities. Work may be audited at the sites, laboratories, or contractor locations. Activities, or documents ascertained to be noncompliant with

quality assurance requirements will be documented. Corrective actions will be mandated through audit finding sheets attached to the audit report. Audit findings are logged, maintained, and controlled by the Task Manager.

Personnel assigned to quality assurance functions will have the responsibility to issue and control Corrective Action Request (CAR) Forms (Figure 12.1 or similar). The CAR identifies the out-of-compliance condition, reference document(s), and recommended corrective action(s) to be administered. The CAR is issued to the personnel responsible for the affected item or activity. A copy is also submitted to the Project Manager. The individual to whom the CAR is addressed returns the requested response promptly to the QA personnel, affixing his/her signature and date to the corrective action block, after stating the cause of the conditions and corrective action to be taken. The QA personnel maintain the log for status of CARs, confirms the adequacy of the intended corrective action, and verifies its implementation. CARs will be retained in the project file for the records.

Any project personnel may identify noncompliance issues; however, the designated QA personnel are responsible for documenting, numbering, logging, and verifying the close out action. The Project Manager will be responsible for ensuring that all recommended corrective actions are implemented, documented, and approved.

FIGURE 12.1

CORRECTIVE ACTION REQUEST

Number: _____ Date: _____

TO: _____

You are hereby requested to take corrective actions indicated below and as otherwise determined by you to (a) resolve the noted condition and (b) to prevent it from recurring. Your written response is to be returned to the project quality assurance manager by _____

CONDITION:

REFERENCE DOCUMENTS:

RECOMMENDED CORRECTIVE ACTIONS:

Originator	Date	Approval	Date	Approval	Date
_____	_____	_____	_____	_____	_____

RESPONSE

CAUSE OF CONDITION

CORRECTIVE ACTION

(A) RESOLUTION

(B) PREVENTION

(C) AFFECTED DOCUMENTS

C.A. FOLLOWUP:

CORRECTIVE ACTION VERIFIED BY: _____ DATE: _____

SECTION 13

REFERENCES

USEPA, 1986. SW-846 "Test Method for Evaluating Solid Waste," dated November 1986. U.S. Environmental Protection Agency, Washington, D.C.

Taylor, J. K., 1987. Quality Assurance of Chemical Measurements. Lewis Publishers, Inc., Chelsea, Michigan

USEPA, 1987. Data Quality Objectives for Remedial Response Actions Activities: Development Process, EPA/540/G-87/003, OSWER Directive 9355.0-7- U.S. Environmental Protection Agency, Washington, D.C.

USEPA, 1992a. CLP Organics Data Review and Preliminary Review. SOP No. HW-6, Revision #8, dated January 1992. USEPA Region II.

USEPA, 1992b. Evaluation of Metals Data for the Contract Laboratory Program (CLP) based on SOW 3/90. SOP No. HW-2, Revision XI, dated January 1992. USEPA Region II.

TABLE 4.1

SUMMARY OF SAMPLES AND ANALYSES

REMEDIAL ACTION – PARCEL A (FORMER IRM AREA), ATLAS PARK, GLENDALE, QUEENS

Matrix	Parameter	Analytical Method	Field Samples				QC Blanks		Total
			Field Samples	Field Duplicate	MS/MSD[a] (Total)	Sub-Total	Trip Blank	Rinse Blank (b)	
Soil Samples (Post-Excavation Samples)	TCL/STARS VOCs	EPA 8260/8021	110	6	6/6	128	-	-	134
	TCL/STARS SVOCs	EPA 8270	110	6	6/6	128	-	-	134
	PCBs	EPA 8080	110	6	6/6	128	-	-	134
	TAL Metals	EPA 6010, 7470/7471, 7841, 9010	110	6	6/6	128	-	-	134
	TCL Pesticides	EPA 8081A	45	0	0	45	-	-	45
	TCL Herbicides	EPA 8151A	45	0	0	45	-	-	45
Groundwater Samples	TCL VOCs	EPA 8260	4	1	1/1	7	1	1	9
	TCL SVOCs	EPA 8270	4	1	1/1	7	-	1	8
	TAL Metals	EPA 6010, 7470/7471, 7841,	4	1	1/1	7	-	1	8
	PCBs	9010	4	1	1/1	7	-	1	8
	TCL Pesticides	EPA 8080	4	1	1/1	7	-	1	8
	TCL Herbicides	EPA 8081A EPA 8151A	4	1	1/1	7	-	1	8
Soil Vapor Samples	VOCs	EPA TO-15	8 (c)	-	-	8 (c)	1	-	9 (c)
Soil/Waste Characterization	TCLP VOCs	EPA SW 1311/8260B	(d)	-	-	(d)	-	-	(d)
	TCLP SVOCs	EPA SW 1311/8270C							
	TCLP Metals	EPA SW 1311/6010B/7470A							
	TCLP Pesticides	EPA SW 1311/8081A							
	TCLP Herbicides	EPA SW 1311/8151A							
	Ignitability	SW846 1010							
	Reactivity	SW846 Sect. 7.3							
	Corrosivity	SW846 9045							

Notes:

a) Matrix spike / matrix spike duplicate for organic analyses; matrix spike and laboratory duplicate for inorganic analysis.
b) Rinse blanks for groundwater sampling will be collected off a non-dedicated, decontaminated submersible or peristaltic pump, if one is used.
c) Includes two (2) ambient air samples collected at same time as soil vapor samples
d) To be determined during field work in conjunction with remedial contractor and disposal facilities.

TABLE 4.1

SUMMARY OF SAMPLES AND ANALYSES

REMEDIAL ACTION – PARCEL A (FORMER IRM AREA), ATLAS PARK, GLENDALE, QUEENS

Matrix	Parameter	Analytical Method	Field Samples				QC Blanks		Total
			Field Samples	Field Duplicate	MS/MSD[a] (Total)	Sub-Total	Trip Blank	Rinse Blank (b)	
Soil Samples (Post-Excavation Samples)	TCL/STARS VOCs	EPA 8260/8021	110	6	6/6	128	-	-	134
	TCL/STARS SVOCs	EPA 8270	110	6	6/6	128	-	-	134
	PCBs	EPA 8080	110	6	6/6	128	-	-	134
	TAL Metals	EPA 6010, 7470/7471, 7841, 9010	110	6	6/6	128	-	-	134
	TCL Pesticides	EPA 8081A	45	0	0	45	-	-	45
	TCL Herbicides	EPA 8151A	45	0	0	45	-	-	45
Groundwater Samples	TCL VOCs	EPA 8260	4	1	1/1	7	1	1	9
	TCL SVOCs	EPA 8270	4	1	1/1	7	-	1	8
	TAL Metals	EPA 6010, 7470/7471, 7841,	4	1	1/1	7	-	1	8
	PCBs	9010	4	1	1/1	7	-	1	8
	TCL Pesticides	EPA 8080	4	1	1/1	7	-	1	8
	TCL Herbicides	EPA 8081A	4	1	1/1	7	-	1	8
		EPA 8151A							
Soil Vapor Samples	VOCs	EPA TO-15	8 (c)	-	-	8 (c)	1	-	9 (c)
Soil/Waste Characterization	TCLP VOCs	EPA SW 1311/8260B	(d)	-	-	(d)	-	-	(d)
	TCLP SVOCs	EPA SW 1311/8270C							
	TCLP Metals	EPA SW 1311/6010B/7470A							
	TCLP Pesticides	EPA SW 1311/8081A							
	TCLP Herbicides	EPA SW 1311/8151A							
	Ignitability	SW846 1010							
	Reactivity	SW846 Sect. 7.3							
	Corrosivity	SW846 9045							

Notes:

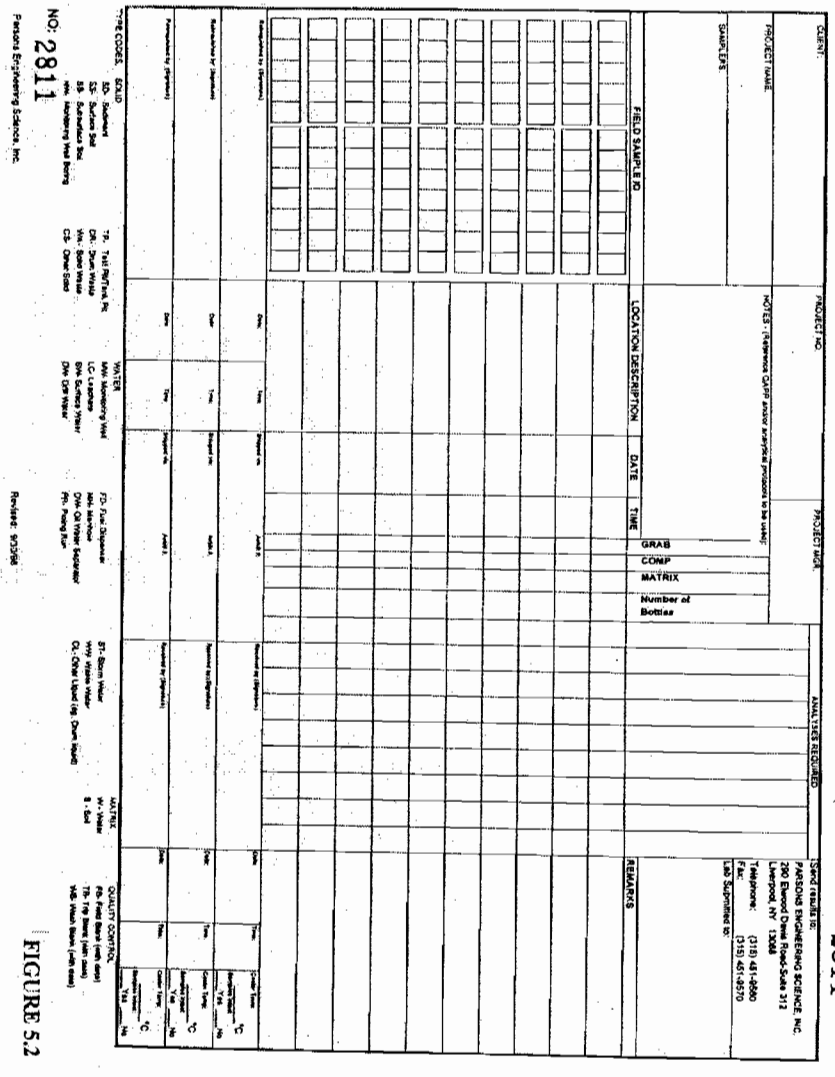
a) Matrix spike / matrix spike duplicate for organic analyses; matrix spike and laboratory duplicate for inorganic analysis.

b) Rinse blanks for groundwater sampling will be collected off a non-dedicated, decontaminated submersible or peristaltic pump, if one is used.

c) Includes two (2) ambient air samples collected at same time as soil vapor samples

d) To be determined during field work in conjunction with remedial contractor and disposal facilities.

Figure 5.2 Chain-of-Custody Form



NO: 2811

Parsons Engineering Science, Inc.

Revised: 9/2/98

FIGURE 5.2

APPENDIX D

HEALTH AND SAFETY PLAN
FOR
REMEDIAL ACTIVITIES IN PARCEL A (FORMER IRM AREA)
THE SHOPS AT ATLAS PARK, GLENDALE, NY

Prepared For:

Atlas Park LLC

8000 Cooper Avenue
Glendale, NY 11385

Prepared By:

Langan Engineering and Environmental Services, P.C.
360 West 31st Street
New York, New York 10001

AUGUST 2005

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EMERGENCY CONTACTS

Emergency contacts are listed on Table 0.1.

EMERGENCY PROCEDURES

Emergency procedures are described in Section 6.

SITE SPECIFIC HAZARDS AND TRAINING

Site Specific Hazards are described in Section 2.

The Field Safety Officer (FSO) will be responsible for providing site-specific training to all personnel that work at the site. This training will cover the following topics:

- Names of personnel responsible for site safety and health.
- Hazards potentially present at the site.
- Proper use of personal protective equipment.
- Work practices by which the employee can minimize risk from hazards.
- Acute effects of compounds at the site.
- Decontamination procedures.

Personnel will be required to sign and date the Site-Specific Training Form provided in Attachment B prior to working on-site.

GENERAL HEALTH AND SAFETY REQUIREMENTS

Personnel will be required to sign and date the Health and Safety Plan and Work Plan Acceptance Form provided in Attachment B prior to working on-site.

Personnel Protective Equipment

Level D protection will be worn for initial entry on-site and for all activities except as noted in Section 3. Level D protection will consist of:

- Standard work clothes
- Steel-toe safety boots
- Safety glasses or goggles must be worn when splash hazard is present

- Nitrile outer gloves and PVC or nitrile inner gloves must be worn during all sampling activities
- Hard hat (must be worn during all sampling activities)

Modified Level D protection may be required under conditions where potential contact of the skin or clothes with significant contamination occurs. Modified Level D is the same as Level D but includes Tyvek coveralls and disposable polyethylene overboots.

Level C protection, unless otherwise specified in Section 3, will consist of Level D equipment and the following additional equipment:

- Full-face or half-mask air-purifying respirator (APR)
- Combination dust/organic vapor cartridges
- Tyvek coveralls if particulate hazard present
- PE-Coated Tyvek coverall if liquid contamination present
- PVC or nitrile inner and nitrile outer gloves
- 5-minute escape SCBA

Level B protection, unless otherwise specified in Section 3, will consist of Level D equipment and the following additional equipment:

- Hard hat
- Positive Pressure SCBA or positive pressure air line and respirator with escape SCBA
- PE-Coated Tyvek coverall
- Nitrile outer and PVC or nitrile inner gloves
- Nitrile boot covers

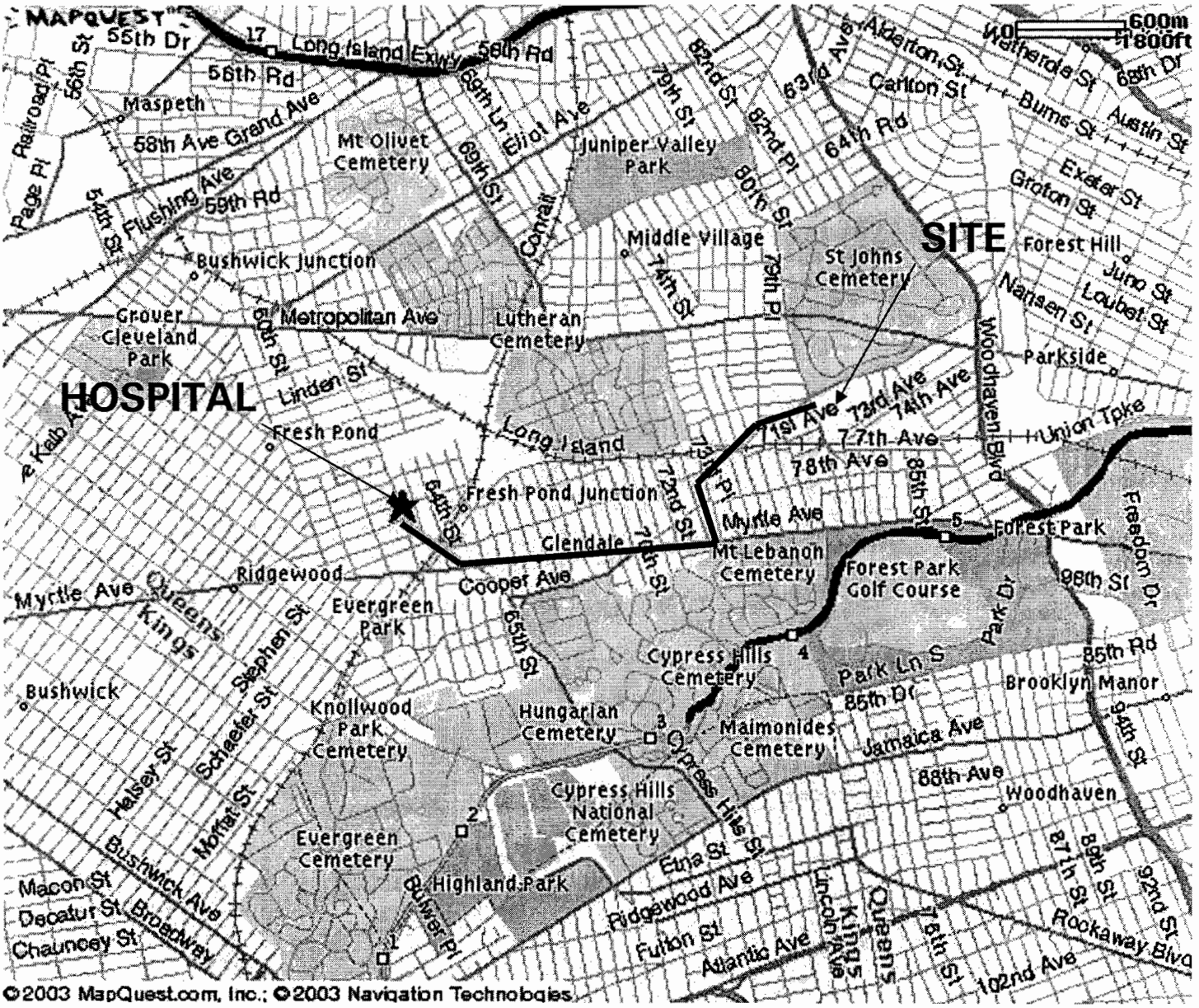
Air Monitoring

A summary of the action levels and restrictions is presented on Table 0.2.

HOSPITAL ROUTE PLAN (Family Health Center in Flushing, New York)

Site Location: **8000 Cooper Avenue, Glendale, New York**

Hospital Location: **6852 Fresh Pond Road, Flushing, New York**



Route to Hospital

From the proposed Shops at Atlas Park Development, located at 8000 Cooper Avenue, Glendale, NY, to Family Health Center, located at 6852 Fresh Pond Road, Flushing, NY.

1. Start out going NORTH on 80Th Street to Cooper Avenue.
2. Turn LEFT onto Cooper Avenue.
3. Turn LEFT onto 73rd Place
4. Turn RIGHT onto Myrtle Avenue
5. Turn RIGHT onto Cypress Hills Street.
6. Turn RIGHT onto Fresh Pond Road

Total Distance: 1.67 miles

Total Estimated Time: 6 minutes

Family Health Center - Ridgewood

6852 Fresh Pond Road

Flushing, New York 11385-5230

(718)-497-4455

TABLE 0.1
EMERGENCY CONTACTS

In the event of any situation or unplanned occurrence requiring assistance, the appropriate contact(s) should be made from the list below. For emergency situations, contact should first be made with the Field Team Leader (or designee) and the Site Safety Officer, who will notify emergency personnel who will then contact the appropriate response teams. This emergency contacts list must be in an easily accessible location at the site.

Emergency Contacts	**Phone Number**
Fire Department:	911
Police:	911
New York City-Long Island One Call Center: (3 day notice required for utility markouts)	(800) 272-4480
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
Medical Emergency	
Ambulance Service:	911
Hospital Name:	Family Health Center - Ridgewood
Hospital Phone Number:	718-497-4455
Hospital Address:	6852 Fresh Pond Road Flushing, New York 11385-5230
Route to Hospital:	See Page 4
Travel Time From Site:	6 minutes
Langan Contacts	
Principal/Associate:	Joel Landes, P.E. (212) 479-5404
Program Manager	Marc Gallagher, P.E. (212) 479-5408
Project Manager:	John Rhyner, P.G. (212) 479-5423
Health & Safety Officer:	Bob Koto, P.G. (201) 398-4566
Field Safety Officer	Jamie Barr (cell) 917-882-5428
Field Team Leader	Jamie Barr (cell) 917-882-5428

TABLE 0.2
SUMMARY OF ACTION LEVELS AND RESTRICTIONS[2]

Conditions for Level D:

All areas

- PID readings < 25 ppm and benzene < 1 ppm
- No visible fugitive dust emissions from site activities

Conditions for Level C:

All areas

- Where PID readings > 25 ppm (sustained for 15 minutes in the breathing zone) to 200 ppm and benzene < 5ppm, and/or
- Any visible fugitive dust emissions from site activities that disturb contaminated soil.

Conditions for Level B (or retreat):

All areas

- Where PID readings > 500 ppm or benzene > 25 ppm,
- Visible fugitive dust emissions from site activities cloud the surrounding air.

SECTION 1

INTRODUCTION

1.1 PURPOSE AND POLICY

The purpose of this safety plan is to establish personnel protection standards and mandatory safety practices and procedures. This plan assigns responsibilities, establishes standard operating procedures, and provides for contingencies that may arise while operations are being conducted during the boring, sampling, and remedial excavation operations at the Atlas site.

The provisions of the plan are mandatory for all on-site personnel. Any supplemental plans used by subcontractors shall conform to this plan at a minimum. All personnel who engage in project activities must be familiar with this plan, comply with its requirements, and sign the Plan Acceptance Form (Attachment B), page number B-5, prior to working on the site. The Plan Acceptance Form must be submitted to the Langan Health and Safety Officer (HSO).

1.2 SITE DESCRIPTION

Currently the site consists of a 8.474 acre open parcel of land, formerly containing industrial buildings. The site is rectangular in shape, bounded by Cooper Avenue to the north, Long Island Railroad right-of-way to the south, Atlas Terminals to the east, and 80th street to the west. Entrance and exits are located on Cooper Avenue and 80th street. The site in enclosed by chain-link fencing and building exteriors.

1.3 SCOPE OF WORK

The scope of work for the Remedial Action (RA)/Interim Remedial Measures (IRM) activities are summarized below. This was developed based on the Phase II Remedial Investigation completed by Langan and the proposed site development plans. The work will include the following tasks:

Task 1: Soil Excavation, UST Closure, Soil Sampling and Soil Gas Sampling

Excavation will proceed across the entire 8.474 acre site to depths ranging from one to ten feet, in an attempt to remove all soils exceeding TAGM 4046 guidance values. Those soils found to be TAGM clean will be left in-place or re-used onsite as backfill material for construction purposes.

A number of USTs are known to exist on the site and will require proper closure, consisting of pumping out, excavation, sampling, and disposal of soils and tank materials.

Soil samples will be collected for the purpose of waste characterization and confirmation of TAGM clean conditions. Each sample will be visually inspected for evidence of contamination and screened for the presence of volatile organic compounds with a PID.

Task 2: In-Situ Soil Characterization and Soil Gas Sampling utilizing a Geoprobe

A geoprobe drill rig will be utilized in various areas of the site to complete in-situ soil sampling for the purpose of waste characterization. No more than 40 geoprobes are expected.

Soil gas sampling will be completed in the proposed building footprints that contain sub-grade structures (ie. basements). Samples will be collected in laboratory supplied Suma canisters and analyzed for the full TO-15 list.

General Task Issues

Identified potential issues related to work at this Site include:

- Low levels of regulated petroleum compounds in soils (VOCs and sVOCs) in soils around USTs and an ash layer in the fill,
- Low levels of metals contained in the ash layer in the fill,
- Potential hazards exist with the presence of operational construction equipment such as excavators, trucks, etc.

1.4 LANGAN PROJECT TEAM ORGANIZATION

Table 1.1 describes the responsibilities of Langan on-site personnel associated with this project. The names of principal personnel associated with this project are:

Program Manager	Mr. Marc Gallagher, P.E.
Project Manager:	Mr. Joel Landes, P.E.
Technical Manager	Mr. John Rhyner, P.G.
H&S Officer (HSO):	Mr. Robert Koto, P.G.
Field Team Leader (FTL):	Mr. Jamie Barr
Field Safety Officer (FSO):	Mr. Jamie Barr, Mr. Prithviraj Patil (alternate)

All Langan personnel have been appropriately trained in first aid and hazardous waste safety procedures, including the operating and fitting of personal protective equipment, and are experienced with the field operations planned for this site.

TABLE 1.1
ON-SITE PERSONNEL
AND RESPONSIBILITIES

PROJECT MANAGER - Assumes total control over site activities. Reports to upper-level management. Has authority to direct response operations.

Responsibilities:

- Prepares and organizes the background review of the situation, the Work Plan, the Site Health and Safety Plan, and the field team.
- Obtains permission for site access and coordinates activities with appropriate officials.
- Ensures that the Work Plan is executed and on schedule.
- Briefs the field team on their specific assignments.
- Coordinates with the site Health and Safety Officer (HSO) to ensure that health and safety requirements are met.
- Prepares the final report and support files on the response activities.
- Serves as the liaison with public officials.

FIELD SAFETY OFFICER (FSO) - Advises the HSO and Project Manager on all aspects of health and safety on site. Stops work if any operation threatens worker or public health or safety.

Responsibilities:

- Ensures that all necessary Health and Safety Equipment is available on-site. Ensures that all equipment is functional.
- Periodically inspects protective clothing and equipment.
- Ensures that protective clothing and equipment are properly stored and maintained.
- Controls entry and exit at the Access Control Points.
- Coordinates health and safety program activities with the Project HSO.
- Confirms each team member's suitability for work based on a physician's recommendation.
- Monitors the work parties for signs of stress, such as cold exposure, heat stress, and fatigue.
- Implements the Site Health and Safety Plan.
- Conducts periodic inspections to determine if the Site Health and Safety Plan is being followed.
- Enforces the "buddy" system.

TABLE 1.1 - CONTINUED
ON-SITE PERSONNEL
AND RESPONSIBILITIES

Site Safety Officer Responsibilities (continued)

- Knows emergency procedures, evacuation routes, and the telephone numbers of the ambulance, local hospital, poison control center, fire department, and police department.
- Notifies, when necessary, local public emergency officials.
- Coordinates emergency medical care.
- Sets up decontamination lines and the decontamination solutions appropriate for the type of chemical contamination on the site.
- Controls the decontamination of all equipment, personnel, and samples from the contaminated areas.
- Assures proper disposal of contaminated clothing and materials.
- Ensures that all required equipment is available.
- Advises medical personnel of potential exposures and consequences.
- Notifies emergency response personnel by telephone or radio in the event of an emergency.

FIELD TEAM LEADER - Advises the Project Manager on all aspects of health and safety on site. Stops work if any operation threatens worker or public health or safety. Is directly responsible for the field team and the safety of site operations.

Responsibilities:

- Manages field operations.
- Executes the Work Plan and schedule.
- Enforces safety procedures.
- Coordinates with the Site Safety Officer in determining protection level.
- Enforces site control.
- Documents field activities and sample collection.
- Serves as a liaison with public officials.

WORK TEAM – Langan Inspectors, Soil Samplers, Geoprobe Drillers

Responsibilities:

- Safely completes the on-site tasks required to fulfill the Work Plan.
- Complies with Site Safety Plan.
- Notifies Site Safety Officer or supervisor of suspected unsafe conditions.

SECTION 2

RISK ANALYSIS

2.1 CHEMICAL HAZARDS

Potential contaminants that may be encountered while conducting intrusive activities at the project site include SVOCs, VOCs, and heavy metals. Some relevant properties of these compounds are shown in Table 2.1.

It is expected that the major chemical concerns at the site will be related to ash which has been shown to contain low levels of heavy metals and SVOCs. It is not anticipated that dust onsite during excavation activities will be a problem, but the air will be visually monitored for particulates with three PDR dust monitoring stations at the site periometer, and a PID will be used to monitor for volatiles. When particulates and contamination become evident, the necessary control measures will be taken.

In addition to the compounds detected onsite, some of the solvents used in decontamination of equipment are potentially hazardous to human health if they are not used properly. Material Safety Data Sheets for substances that will be used on site and a select number of site contaminants are included in Attachment C.

2.2 RADIATION HAZARDS

No radiation hazards are known or expected at the site.

2.3 BIOLOGICAL HAZARDS

2.3.1 Animals

During site operations, animals such as dogs, pigeons, sea gulls, mice, and rats may be encountered. Workers will use discretion and avoid all contact with animals. Bites and scratches from dogs can be painful and if the animal is rabid, the potential for contracting rabies exists. Contact with rat and mice droppings may lead to contracting hantavirus. Inhalation of dried pigeon droppings may lead to psittacosis; crytococcosis and histoplasmosis are also diseases associated with exposure to dried bird droppings but these are less likely to occur in this occupational setting.

2.3.2 Insects

Insects, including bees, wasps, hornets, mosquitoes, and spiders, may be present at this site. Some individuals may have a severe allergic reaction to an insect bite or sting that can result in a life threatening condition. In addition, mosquito bites may lead to St. Louis encephalitis or West Nile encephalitis. Personnel that have been bitten or stung by

an insect at the Site should notify the HSO or FSO of such immediately. The following is a list of preventive measures:

- Apply insect repellent prior to fieldwork and or as often as needed throughout the shift.

- Wear proper protective clothing (work boots, socks and light colored pants).

- When walking in wooded areas, to the extent possible avoid contact with bushes, tall grass, or brush.

- Field personnel who may have insect allergies (e.g., bee sting) should provide this information to the HSO or FSO prior to commencing work, and will have allergy medication on Site.

The HSO or FSO will instruct the project personnel in the recognition and procedures for encountering potentially hazardous insects at the Site.

Lyme disease is caused by infection from a deer tick that carries a spirochete. During the painless tick bite, the spirochete may be transmitted into the bloodstream, which could lead to the worker contracting Lyme disease. This flu like illness occurs out of season, commonly happening between May and October when ticks are more active. Symptoms can include a stiff neck, chills, fever, sore throat, headache, fatigue and joint pain. Early signs may include an expanding skin rash and joint pain. If left untreated, Lyme disease can cause serious nerve or heart problems as well as a disabling type of arthritis. If personnel feel sick or have signs similar to those above, they should notify the HSO or FSO immediately.

It is recommended that personnel check themselves when in areas that could harbor deer ticks, wear light color clothing and visually check themselves and their buddy when coming from wooded or vegetation covered areas. If a tick is found biting an individual, the HSO or FSO should be contacted immediately. The tick can be removed by pulling gently at the head with tweezers. The affected area should then be disinfected with an antiseptic wipe.

2.4 PHYSICAL HAZARDS

2.4.1 Explosion

No explosion hazards are expected for the scope of work at this site.

2.4.2 Heat Stress

The use of Level C protective equipment, or greater, may create heat stress. Monitoring of personnel wearing personal protective clothing should commence when the ambient temperature is 72°F or above. Table 2.2 presents the suggested frequency for

such monitoring. Monitoring frequency should increase as ambient temperature increases or as slow recovery rates are observed. Refer to the Table 2.3 below to assist in assessing when the risk for heat related illness is likely. To use this table, the ambient temperature and relative humidity must be obtained (a regional weather report should suffice). Heat stress monitoring should be performed by the Field Safety Officer, who shall be able to recognize symptoms related to heat stress.

To monitor the workers, be familiar with the following heat-related disorders and their symptoms:

- **Prickly Heat** (Heat rash)
  - Painful, itchy red rash. Occurs during sweating, on skin covered by clothing.
- **Heat Cramps**
  - Painful spasm of arm, leg or abdominal muscles, during or after work.
- **Heat Exhaustion**
  - Headache, nausea, dizziness. Cool, clammy, moist skin. Heavy sweating. Weak, fast pulse. Shallow respiration, normal temperature.
- **Heat Fatigue**
  - Weariness, irritability, loss of skill for fine or precision work. Decreased ability to concentrate. No loss of temperature control.
- **Heat Syncope** (Heat Collapse)
  - Fainting while standing in a hot environment.
- **Heat Stroke**
  - Headache, nausea, weakness, hot dry skin, fever, rapid strong pulse, rapid deep respirations, loss of consciousness, convulsions, coma. **This is a life threatening condition.**

    Do not permit a worker to wear a semi-permeable or impermeable garment when they are showing signs or symptoms of heat-related illness.

To monitor the worker, measure:

- Heart rate. Count the radial pulse during a 30-second period as early as possible in the rest period.
  - If the heart rate exceeds 100 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.
  - If the heart rate still exceeds 100 beats per minute at the next rest period, shorten the following work cycle by one-third. A worker cannot return to work after a rest period until their heart rate is below 100 beats per minute.

- Oral temperature. Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).
    - If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period. A worker cannot return to work after a rest period until their oral temperature is below 99.6°F.
    - If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following cycle by one-third.
    - Do not permit a worker to wear a semi-permeable or impermeable garment when oral temperature exceeds 100.6°F (38.1°C).

Prevention of Heat Stress - Proper training and preventative measures will aid in averting loss of worker productivity and serious illness. Heat stress prevention is particularly important because once a person suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat related illness. To avoid heat stress the following steps should be taken:

- Adjust work schedules.
- Mandate work slowdowns as needed.
- Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.
- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, id., eight fluid ounces (0.23 liters) of water must be ingested for approximately every eight ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:
    - Maintain water temperature 50° to 60°F (10° to 16.6°C).
    - Provide small disposal cups that hold about four ounces (0.1 liter).
    - Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.
    - Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

- Train workers to recognize the symptoms of heat related illness.

2.4.3 Cold-Related Illness

If work on this project begins in the winter months, thermal injury due to cold exposure can become a problem for field personnel. Systemic cold exposure is referred to as hypothermia. Local cold exposure is generally called frostbite.

Hypothermia - Hypothermia is defined as a decrease in the patient core temperature below 96°F. The body temperature is normally maintained by a combination of central (brain and spinal cord) and peripheral (skin and muscle) activity. Interference with any of these mechanisms can result in hypothermia, even in the absence of what normally is considered a "cold" ambient temperature. Symptoms of hypothermia include: shivering, apathy, listlessness, sleepiness, and unconsciousness.

Frostbite - Frostbite is both a general and medical term given to areas of local cold injury. Unlike systemic hypothermia, frostbite rarely occurs unless the ambient temperatures are less than freezing and usually less than 20°F. Symptoms of frostbite are: a sudden blanching or whitening of the skin; the skin has a waxy or white appearance and is firm to the touch; tissues are cold, pale, and solid.

Prevention of Cold-Related Illness - To prevent cold-related illness:

- Educate workers to recognize the symptoms of frostbite and hypothermia
- Identify and limit known risk factors:
- Assure the availability of enclosed, heated environment on or adjacent to the site.
- Assure the availability of dry changes of clothing.
- Assure the availability of warm drinks.
- Start (oral) temperature recording at the job site:
    - At the FSO or Field Team Leader's discretion when suspicion is based on changes in a worker's performance or mental status.
    - At a worker's request.
    - As a screening measure, two times per shift, under unusually hazardous conditions (e.g., wind-chill less than 20°F, or wind-chill less than 30°F with precipitation).
    - As a screening measure whenever any one worker on the site develops hypothermia.

Any person developing moderate hypothermia (a core temperature of 92°F) cannot return to work for 48 hours.

2.4.4 Noise

Work activities during the proposed construction activities may be conducted at locations with high noise levels from the operation of equipment. Hearing protection will be used as necessary.

2.4.5 Hand and Power Tools

In order to complete the various tasks for the project, personnel will utilize hand and power tools. The use of hand and power tools can present a variety of hazards, including physical harm from being struck by flying objects, being cut or struck by the tool, fire, and electrocution. Ground Fault Circuit Interrupters (GFCIs) are required for all portable tools.

2.4.6 Slips, Trips and Fall Hazards

Care should be exercised when walking at the site, especially when carrying equipment. The presence of surface debris, uneven surfaces, facility equipment, and soil piles contribute to tripping hazards

2.4.7 Utilities (Electrocution and Fire Hazards)

The possibility of encountering underground utilities poses fire, explosion, and electrocution hazards. All excavation work will be preceded by review of available utility drawings and by notification of the subsurface work to the N.Y. One Call Center. Potential adverse effects of electrical hazards include burns and electrocution, which could result in death.

2.5 TASK HAZARD ANALYSIS

2.5.1 Soil Excavation, UST Closure, Soil Sampling and Soil Gas Sampling

Excavation and soil sampling activities associated with these tasks are inherently dangerous. Special attention should be given to establishing the location of any underground utilities prior to excavating.

Chemical exposure may occur as excavation activities progress across the site and workers are exposed to contaminates in the excavated soils. Also, sampling of both in-situ and stockpiled soils presents a potential exposure hazard. Activities will be conducted initially in Level D but may be upgraded to Modified Level D. Although not anticipated, there will be a Level C and B contingency should pockets of contaminants be brought to the surface and breathing zone air becomes contaminated.

If evidence of historic contamination is encountered during remediation activities (such as ash) or other contaminated materials, such as oily materials, high PID readings, etc., the FSO will make a determination of the appropriate level of personnel protection.

2.5.2 In-Situ Soil Characterization and Soil Gas Sampling utilizing a Geoprobe

Geoprobe activities associate with these activities are inherently dangerous. Prior to geoprobe drilling, underground utilities should be located and flagged on the surface.

The potential for exposure to a chemical hazard exists while sampling the soils from the macro-core sampler, and discarding of cuttings. Activities will be conducted initially in Level D but may be upgraded to Modified Level D. Although not anticipated, there will be a Level C and B contingency should pockets of contaminants be brought to the surface and breathing zone air becomes contaminated. Monitoring of breathing zone will be completed continuously for the duration of these tasks.

Table 2.2
Suggested Frequency of Physiological Monitoring
For Fit and Acclimated Workers[a]

Adjusted Temperature[b]	Normal Work Ensemble[c]	Impermeable Ensemble
90°F or above (32.2°C) or above	After each 45 min. of work	After each 15 min. of work
87.5°F (30.8°-32.2°C)	After each 60 min. of work	After each 30 min. of work
82.5°-87.5°F (28.1°-30.8°C)	After each 90 min. of work	After each 60 min. of work
77.5°-82.5°F (25.3°-28.1°C)	After each 120 min. of work	After each 90 min. of work
72.5°-77.5°F (22.5°-25.3°C)	After each 150 min. of work	After each 120 min. of work

a For work levels of 250 kilocalories/hour.

b Calculate the adjusted air temperature (ta adj) by using this equation: ta adj ^{o}F = ta ^{o}F + (13 x % sunshine). Measure air temperature (ta) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

c A normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Table 2.3 - HEAT INDEX

ENVIRONMENTAL TEMPERATURE (Fahrenheit)

RELATIVE HUMIDITY	70	75	80	85	90	95	100	105	110	115	120
	APPARENT TEMPERATURE*										
0%	64	69	73	78	83	87	91	95	99	103	107
10%	65	70	75	80	85	90	95	100	105	111	116
20%	66	72	77	82	87	93	99	105	112	120	**130**
30%	67	73	78	84	90	96	104	113	123	**135**	**148**
40%	68	74	79	86	93	101	110	123	**137**	**151**	
50%	69	75	81	88	96	107	120	**135**	**150**		
60%	70	76	82	90	100	114	**132**	**149**			
70%	70	77	85	93	106	124	**144**				
80%	71	78	86	97	113	**136**					
90%	71	79	88	102	122						
100%	72	80	91	108							

*Combined Index of Heat and Humidity...what it "feels like" to the body
Source: National Oceanic and Atmospheric Administration

How to use Heat Index:
1. Across top locate Environmental Temperature
2. Down left side locate Relative Humidity
3. Follow across and down to find Apparent Temperature
4. Determine Heat Stress Risk on chart at right

Note: Exposure to full sunshine can increase Heat Index values by up to 15 degrees F.

Apparent Temperature	Heat Stress Risk with Physical Activity and/or Prolonged Exposure
90-105	Heat Cramps or Heat Exhaustion Possible
105-130	Heat Cramps or Heat Exhaustion Likely, Heat Stroke Possible
>130	Heatstroke Highly Likely

SECTION 3

PERSONNEL PROTECTION AND MONITORING

3.1 OSHA TRAINING

All on-site personnel who will be actively involved in the remediation activities must have completed hazardous waste operations-related training, as required by OSHA Regulations 29 CFR 1910.120. Personnel who completed this training more than 12 months prior to the start of the project must have completed an 8-hour refresher course within the past 12 months. Documentation of OSHA training for project personnel must be provided to Langan prior to starting work.

3.2 SITE-SPECIFIC TRAINING

The Site Safety Officer will be responsible for developing a site-specific occupational hazard training program and providing training to all personnel that are to work at the site. This training will be conducted prior to starting field work and will consist of the following topics:

- Names of personnel responsible for site safety and health.
- Hazards potentially present at the site.
- Proper use of personal protective equipment.
- Requirements of this HASP.
- Work practices by which the employee can minimize risk from hazards. This may include a specific review of heavy equipment safety, safety during inclement weather, changes in common escape rendezvous point, site security measures, or other site-specific issues that need to be addressed before work begins.
- Safe use of engineering controls and equipment on the site.
- Acute effects of compounds present at the site.
- Decontamination procedures.

Upon completion of site-specific training, workers will sign the Site-Specific-Training Form provided in Attachment B. A copy of the completed Site-Specific Training Form will be included in the project files for future reference.

3.3 MONITORING REQUIREMENTS

Based on the existing site data, it is not expected that organic vapors will be encountered to any significant degree during the proposed IRM remediation activities. However, worker air monitoring will be conducted for VOCs as described below. If levels above the background air monitoring results are encountered in the worker breathing zone, the Community Air Monitoring program as described in Section 6.4 will be implemented.

Although not anticipated to be needed, dust suppression measures will be completed if required while excavation activities are ongoing. Three air monitoring stations will be set up at the perimeter of the site with personal data rams (PDRs) for particulate monitoring.

Air monitoring of the breathing zone will be conducted periodically or continuously during all excavation and sampling activities to assure proper health and safety protection for the team, occupants of the building, and passersby. Initially, ambient air monitoring will be conducted within the work area. If air monitoring measurements above background are encountered, ventilation of the work area will be implemented as described below to verify levels do not exceed acceptable limits as specified in Table 0.2 and Section 3.4.

VOCs will be monitored with a PID in accordance with the HASP with an action level of 25 ppm in the absence of benzene. If the action level is exceeded and adequate ventilation cannot be provided, work will cease and the potential affected portion of the work area will be evacuated until adequate mechanical ventilation can be setup to control the hazard. Level C respiratory protection may be donned in accordance with the HASP if building occupants are not present and the action level is exceeded.

If air monitoring during intrusive operations identifies the presence of volatile organic compounds (not anticipated), the action levels, permissible exposure, engineering controls, and personal protective equipment specified in this HASP will be implemented. A PID (MultiRAE Plus PGM-50 or equivalent) will be used to monitor for organic vapors in the breathing zone and to screen soil samples. Air monitoring results will be recorded in the field book during investigation activities and made available for NYSDEC and NYSDOH review.

The majority of the activities conducted in the IRM area will be in open air spaces and will not require mechanical ventilation. There will be no work in fully enclosed structures.

3.4 SUMMARY OF ACTION LEVELS AND RESTRICTIONS

Conditions for Level D:

All areas

- PID readings < 25 ppm and benzene < 1 ppm
- No visible fugitive dust emissions from site activities

Conditions for Level C:

All areas

- Where PID readings > 25 ppm (sustained for 15 minutes in the breathing zone) to 200 ppm and benzene < 5ppm, and/or
- Any visible fugitive dust emissions from site activities that disturb contaminated soil.

Conditions for Level B (or retreat):

All areas

- Where PID readings > 500 ppm or benzene > 25 ppm,
- Visible fugitive dust emissions from site activities cloud the surrounding air.

Notes:

[1] A PID such as the RaeSystems MiniRae 2000, equipped with a 10.6 eV lamp shall be used to screen for total VOCs. All readings pertain to sustained readings for 15 minutes in the worker breathing zone.

3.4.1 Level D and Modified Level D

Level D protection will be worn for initial entry on-site and initially for all activities. Level D protection will consist of:

- Standard work clothes
- Steel-toe safety boots
- Safety glasses (goggles must be worn when splash hazard is present)
- Nitrile outer gloves and PVC inner gloves must be worn during all activities requiring contact with soils.
- Hard hat (must be worn during all site activities)

Modified Level D is the same as Level D but includes Tyvek coveralls and disposable polyethylene overboots to contact with the skin or clothes if significant contamination is present in subsurface materials.

3.4.2 Level C

The level of personal protection will be upgraded to Level C if the concentration of volatile organic compounds which can be detected with a photoionization detector (PID) in the breathing zone equals or exceeds the specified action limits and the contaminants of concern have characteristic warning properties appropriate for air purifying respirators (e.g. taste, odor). Level C protection will consist of the following equipment:

- Full-face or half-mask air-purifying respirator (APR) or powered air purifier (PAPR), depending on presence and abundance of airborne toxic constituents of concern
- Combination HEPA filter/organic vapor cartridges
- Tyvek coveralls must be worn if particulate hazard present
- PE-coated Tyvek coveralls if liquid contamination present
- Steel-toe safety boots
- Nitrile outer gloves and PVC inner gloves must be worn during all activities requiring contact with soils.
- Hard hat (must be worn during all site activities)

Cartridges will be disposed at the end of each day's use.

3.4.3 Level B (Retreat)

If the concentration of volatile organics which can be detected with a PID equals or exceeds the specified action levels, all field personnel associated with the project will

immediately retreat to a location up-wind of the source of contamination. At this point the Site Safety Officer must consult with the Langan HSO to discuss appropriate actions.

3.4.4 OSHA Requirements for Personal Protective Equipment

All personal protective equipment used during the course of this field investigation must meet the following OSHA standards:

Type of Protection	Regulation	Source
Eye and Face	29 CFR 1910.133 29 CFR 1926.102	ANSI Z87.1-1968
Respiratory	29 CFR 1910.134 29 CFR 1926.103	ANSI Z88.1-1980
Head	29 CFR 1910.135 29 CFR 1926.100	ANSI Z89.1-1969
Foot	29 CFR 1910.136 29 CFR 1926.96	ANSI Z41.1-1967

ANSI = American National Standards Institute

Both the respirator and cartridges specified for use in Level C protection must be fit-tested prior to use in accordance with OSHA regulations (29 CFR 1910.1025; 29 CFR 1910.134).

Based on performance criteria of air purifying respirators, they cannot be worn under the following conditions:

- Oxygen deficiency;
- IDLH concentrations;
- High relative humidity; and
- If contaminant levels exceed designated use concentrations.

SECTION 4

WORK ZONES AND DECONTAMINATION

4.1 SITE WORK ZONES

To reduce the spread of hazardous materials by workers from the contaminated areas to the clean areas, work zones will be delineated at the site. The flow of personnel between the zones should be controlled. The establishment of the work zones will help ensure that personnel are properly protected against the hazards present where they are working, and ensure that work activities and contamination are confined to the appropriate areas. The work zones described below may be modified in the field depending on field conditions.

4.1.1 Hot Zone

Hot zones will be established within a 25 foot radius around each excavation. Unprotected onlookers should be located 50 feet upwind of the activities. All personnel within the hot zone must don the appropriate levels of personal protection as set forth by the FSO. It is not anticipated that Level C or higher will be required for this site.

All personnel within the hot zone will be required to use the specified level of protection. No food, drink, or smoking will be allowed in the hot or warm zones.

4.1.2 Warm Zone

A warm zone will be established and utilized during the field activities. This zone will be established between the hot zone and the cold zone (discussed below), and will include the personnel and equipment necessary for decontamination of equipment and personnel exiting the hot zone. Personnel and equipment in the hot zone must pass through this zone before entering the cold zone. This zone should always be located upwind of the hot zone.

4.1.3 Cold Zone

The cold zone will include the remaining areas of the job site. Break areas and support facilities (include equipment storage and maintenance areas) will be located in this zone. No equipment or personnel will be permitted to enter the cold zone from the hot zone without passing through the decontamination station in the warm zone. Eating, smoking, and drinking will be allowed only in this area.

4.2 DECONTAMINATION

Generally, any water used in decontamination procedures will be placed in containers, temporarily stored on-site, and disposed of appropriately.

4.2.1 Decontamination of Personnel

Decontamination of personnel will be necessary if Level C or Level B protection is used, which is not anticipated based on previous investigation work completed at the site. Decontamination will not be necessary if only Level D protection is used. However, disposable gloves used during sampling activities should be removed and bagged; personnel should be encouraged to remove clothing and shower as soon as is practicable at the end of the day. All clothing should be machine-washed. All personnel will wash hands and face prior to eating and before and after using the restroom.

4.2.2 Decontamination of Field Equipment

Decontamination of field equipment will be performed as required following appropriate procedures presented in the FSP.

4.3 REMEDIAL ACTIVITY-DERIVED WASTE

All PPE related remedial activity derived waste materials (PPE, decontamination waste) will be placed in labeled 55-gallon drums and/or a dedicated, lined roll-off container labeled appropriately. The drums/container will be temporarily stored on-site within a fenced-off area specified by the Site Engineer. The waste will be characterized by Langan for subsequent off-site disposal.

SECTION 5

SAMPLE SHIPMENT

5.1 NON-HAZARDOUS SAMPLES

Samples collected in this study will be classified as both environmental and geotechnical samples.

5.1.1 Environmental Samples

In general, non-hazardous environmental samples are collected from soils that are not expected to contain high levels of hazardous materials, and are submitted for environmental testing.

Sample containers must have a completed sample identification tag and the outside container must be marked "Environmental Sample". The sample tag will be legibly written and completed with an indelible pencil or waterproof ink. The information will also be recorded in a log book. At a minimum, it will include:

- Exact location of sample;
- Time and date sample was collected;
- Name of sampler witnesses (if necessary);
- Project codes, sample station number, and identifying code (if applicable);
- Type of sample (if known);
- Laboratory number (if applicable); and
- Any other pertinent information.

Environmental samples will be packaged and shipped according to the following procedure:

1. Place sample container, properly identified and with a sealed lid, in a polyethylene bag, and seal bag;
2. Place sample in a fiberboard container or metal picnic cooler which has been lined with a large polyethylene bag;
3. Pack cooler with ice to maintain temperature of 4 degrees C;
4. Pack with enough noncombustible, absorbent, cushioning material to minimize the possibility of the container breaking;
5. Seal large bag; and

6. Seal or close outside container.

The appropriate side of the container must be marked "This End Up" and arrows should be drawn accordingly. No DOT marking labeling is required. No DOT shipping papers are required. There are no DOT restrictions on mode of transportation.

5.1.2 Geotechnical Samples

In general, geotechnical samples are non-hazardous samples collected from soils not expected to contain high levels of hazardous materials, and to be submitted for geotechnical analysis.

Sample containers must have a completed label with the designation "geotechnical sample". The sample tag will be legibly written and completed with an indelible pencil or waterproof ink. The information will also be recorded in a log book. At a minimum, it will include:

- Exact sample location (sample # and depth)
- Time and date sample was collected
- Name of sampler
- Project number

Geotechnical samples will be collected in plastic buckets and sent to the geotechnical lab or archived in the Langan sample storage area for testing at a later date (if required).

5.2 HAZARDOUS SAMPLES

Personnel who must complete a Hazardous Goods Airway Bill must first be DOT trained and certified every two years. Drummed waste samples, tank samples, sludge samples, and grossly contaminated soil samples will be shipped as DOT Hazardous Materials. The designation "Flammable Liquid" or "Flammable Solid" will be used. The samples will be transported as follows:

1. Collect sample in a 16 ounce or smaller glass or polyethylene container with nonmetallic Teflon-lined screw cap. Allow sufficient air space (approximately 10% by volume) so container is not liquid full at 54 °C (130 °F). If collecting a solid material, the container plus contents should not exceed 1 pound net weight. If sampling for volatile organic analysis, fill VOA container to septum but place the VOA container inside a 16 ounce or smaller container so the required air space may be provided. Large quantities, up to 3.786 liters (1 gallon), may be collected if the sample's flash point is 23 °C (75 °F) or higher. In this case, the flash point must be marked on the outside container (e.g., carton, cooler), and shipping papers should state that "Flash point is 73 °F or higher."

2. Seal sample and place in a 4-mil thick polyethylene bag, one sample per bag.
3. Place sealed bag inside a metal can with noncombustible, absorbent cushioning material (e.g., vermiculite or earth) to prevent breakage, one bag per can. Pressure-close the can and use clips, tape or other positive means to hold the lid securely.
4. Mark the can with:
    - Name and address of originator
    - "Flammable Liquid N.O.S. UN 1993"
    - (or "Flammable Solid N.O.S. UN 1325)
    - NOTE: UN numbers are now required in proper shipping names.
5. Place one or more metal cans in a strong outside container such as a picnic cooler or fiberboard box. Preservatives are not used for hazardous waste site samples.
6. Prepare for shipping:

    "Flammable Liquid, N.O.S. UN 1993" or "Flammable Solid, N.O.S. UN 1325"; "Cargo Aircraft Only" (if more than 1 quart net per outside package); "Limited Quantity" or "Ltd. Qty."; "Laboratory Samples"; "Net Weight ___" or "Net Volume ___" (of hazardous contents) should be indicated on shipping papers and on outside of shipping container. "This Side Up" or "This End Up" should also be on container. Sign shipper certification.
7. Stand by for possible carrier requests to open outside containers for inspection or modify packaging. It is wise to contact carrier before packing to ascertain local packaging requirements and not to leave area before the carrier vehicle (aircraft, truck) is on its way. The International Air Transport Association's Dangerous Goods regulations will need to be followed for using FedEx for the shipment of hazardous samples.

5.3 Shipping Papers

A blank Langan shipping paper should be filled out and maintained within the driver's reach, whenever a Langan employee carries hazardous materials in a vehicle in quantities above those allowed for Materials of Trade (MOTs). Such materials may include more than 8 gallons of the following:

- Gasoline (for use in a generator) UN 1203, Guide #27;
- Methanol (for use in decontamination procedures) UN 1230, Guide #28;
- Nitric Acid (for use in decontamination procedures) UN 1760, Guide #60; and
- Hydrochloric Acid (for use in decontamination procedures) UN 1789, Guide #60.

Other materials may include the following:

- > 220 pounds of compressed Gas [Air, Compressed] (calibration gas for the PID, or Grade D breathing air for Level B work) UN 1002, Class 2.2; and
- Other hazardous materials as defined by the DOT.

Appropriate MSDSs should be maintained with the shipping papers and/or the pocket DOT Emergency Response Guidebook.

SECTION 6

ACCIDENT PREVENTION AND CONTINGENCY PLAN

6.1 ACCIDENT PREVENTION

6.1.1 Site-Specific Training

All field personnel will receive health and safety training prior to the initiation of any site activities. The site-specific training form provided in Attachment B must be signed, dated, and returned to the Langan Field Safety Officer. On a day-to-day basis, individual personnel should be constantly alert for indicators of potentially hazardous situations and for signs and symptoms in themselves and others that warn of hazardous conditions and exposures. Rapid recognition of dangerous situations can avert an emergency. Before daily work assignments, a regular meeting should be held. Discussion should include:

- Tasks to be performed;
- Time constraints (e.g., rest breaks, cartridge changes);
- Hazards that may be encountered, including their effects, how to recognize symptoms or monitor them, concentration limits, or other danger signals; and
- Emergency procedures.

6.1.2 Vehicles and Heavy Equipment

Working with large motor vehicles and heavy construction equipment could be a major hazard at this site. Injuries can result from equipment hitting or running over personnel, impacts from flying objects, or overturning of vehicles. Vehicle and heavy equipment design and operation will be in accordance with 29 CFR, Subpart O, 1926.600 through 1926.602. In particular, the following precautions will be utilized to help prevent injuries/accidents.

- Brakes, hydraulic lines, light signals, fire extinguishers, fluid levels, steering, tires, horn, and other safety devices will be checked at the beginning of each shift.
- Large construction motor vehicles will not be backed up unless:
  - The vehicle has a reverse signal alarm audible above the surrounding noise level; or
  - The vehicle is backed up only when an observer signals that it is safe to do so.
- Heavy equipment or motor vehicle cable will be kept free of all nonessential items, and all loose items will be secured.

- Large construction motor vehicles and heavy equipment will be provided with necessary safety equipment (such as seat belts, roll-over protection, emergency shut-off in case of roll-over, backup warning lights and audible alarms).
- Blades and buckets will be lowered to the ground and parking brakes will be set before shutting off any heavy equipment or vehicles.

6.2 SPILL CONTROL PLAN

All personnel must take every precaution to minimize the potential for spills during site operations. Any spill shall be reported immediately to the FSO. Spill control apparatus (sorbent materials) will be located on-site. All materials used for the clean up of spills will be containerized and labeled separately from other wastes.

6.3 CONTINGENCY PLAN

6.3.1 Emergency Procedures

In the event that an emergency develops on site, the procedures delineated herein are to be immediately followed. Emergency conditions are considered to exist if:

- Any member of the field crew is involved in an accident or experiences any adverse effects or symptoms of exposure while on site.
- A condition is discovered that suggests the existence of a situation more hazardous than anticipated.

General emergency procedures, and specific procedures for personal injury, chemical exposure and radiation exposure, are described below.

6.3.2 Chemical Exposure

If a member of the field crew demonstrates symptoms of chemical exposure the procedures outlined below should be followed:

- Another team member (buddy) should remove the individual from the immediate area of contamination. The buddy should communicate to the Field Team Leader (via voice and hand signals) of the chemical exposure. The Field Team Leader should contact the appropriate emergency response agency.
- Precautions should be taken to avoid exposure of other individuals to the chemical.
- If the chemical is on the individual's clothing, the chemical should be neutralized or removed if it is safe to do so.
- If the chemical has contacted the skin, the skin should be washed with copious amounts of water.

- In case of eye contact, an emergency eye wash should be used. Eyes should be washed for at least 15 minutes.
- All chemical exposure incidents must be reported in writing to the Langan Health and Safety Officer. The Field Safety Officer or Field Team Leader is responsible for completing the accident report.

6.3.3 Personal Injury

In case of personal injury at the site, the following procedures should be followed:

- Another team member (buddy) should signal the Field Team Leader that an injury has occurred.
- A field team member trained in first aid can administer treatment to an injured worker.
- The victim should then be transported to the nearest hospital or medical center. If necessary, an ambulance should be called to transport the victim.
- For less severe cases, the individual can be taken to the site dispensary.
- The Field Team Leader or Field Safety Officer is responsible for making certain that an Accident Report Form is completed. This form is to be submitted to the Langan Health and Safety Officer. Follow-up action should be taken to correct the situation that caused the accident.
- Any incident (near miss, property damage, first aid, medical treatment, etc.) must be reported.

A first-aid kit and blood-born pathogens kit will be kept on-site during the field activities.

6.3.4 Evacuation Procedures

- The Field Team Leader will initiate evacuation procedures by signaling to leave the site.
- All personnel in the work area should evacuate the area and meet in the common designated area.
- All personnel suspected to be in or near the contract work area should be accounted for and the whereabouts or missing persons determined immediately.
- The Field Team Leader will then give further instruction.

6.3.5 Procedures Implemented in the Event of a Major Fire, Explosion, or Emergency

- Notify the paramedics and/or fire department, as necessary;

- Signal the evacuation procedure previously outlined and implement the entire procedure;
- Isolate the area;
- Stay upwind of any fire;
- Keep the area surrounding the problem source clear after the incident occurs;
- Complete accident report for and distribute to appropriate personnel.

6.4 COMMUNITY AIR MONITORING PLAN

If above background air monitoring results are encountered in the worker breathing zone for VOCs, community air monitoring will be conducted in compliance with the Community Air Monitoring Plan (CAMP) outlined below.

Continuous monitoring for VOCs will be conducted during all ground intrusive activities (i.e. soil excavation and geoprobe sampling). Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. VOCs will be monitored continuously at the downwind perimeter of the hot zone. Monitoring will be conducted with a PID equipped with a 10.6 eV lamp capable of calculating 15-minute running average concentrations. The following actions will be taken based on organic vapor levels measured:

- If total organic vapor levels exceed 5 ppm above background for the 15-minute average at the perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If total organic vapor levels at the downwind perimeter of the hot zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps work activities will resume provided that the total organic vapor level 200 feet downwind of the hot 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 above background for the 15-minute average.
- If the total organic vapor level is above 25 ppm at the perimeter of the hot zone, activities will be shutdown.

All 15-minute readings will be recorded and available for NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, will also be recorded.

6.4.1 Vapor Emission Response Plan

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the hot zone, excavation activities will be halted or odor controls will

be employed, and monitoring continued. If the organic vapor level decreases below 5 ppm above background, excavation activities can resume, provided:

- The organic vapor level 200 ft. downwind of the hot zone or half the distance to the nearest residential or commercial structure, whichever is less, is below 1 ppm over background, and
- More frequent intervals of monitoring, as directed by the Site Health and Safety Officer, are conducted.

If the organic vapor level is greater than 5 ppm above background at the perimeter of the hot zone, work activities must be shut down or odor controls must be employed. When work shut-down occurs, downwind air monitoring as directed by the Site Health and Safety Officer will be implemented to ensure that vapor emission does not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

6.4.2 Major Vapor Emission

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the work site, or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted or odor controls must be implemented.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 5 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the hot zone, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20 Foot Zone).

If either of the following criteria is exceeded in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be implemented.

- Sustained organic vapor levels approaching 5 ppm above background for a period of more than 30 minutes, or
- Organic vapor levels greater than 5 ppm above background for any time period.

6.4.3 Major Vapor Emission Response Plan

Upon activation, the following activities will be undertaken:

1. The local police authorities will immediately be contacted by the Site Health and Safety Officer and advised of the situation;
2. Frequent air monitoring will be conducted at 30-minute intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Site Health and Safety Officer; and

All Emergency contacts will go into effect as appropriate.

Fugitive dust generation that could affect site workers, site occupants, or the public is not expected for the following reasons: 1) the work areas are all paved with asphalt or concrete, therefore work vehicle traffic will not generate dusts, 2) a majority of the subsurface investigation locations are located indoors within the site buildings, most of which will have been vacated by the time work is conducted, 3) intrusive work is limited to Geoprobe, direct push methods which do not generate large volume soil cuttings, and hollow-stem auger soil borings which generate limited quantities of cuttings that collect directly around borehole and will be shoveled into drums or dumpsters. Although not anticipated to be needed, dust suppression measures will be completed if required while containerizing the cuttings. Therefore, particulate monitoring is not included in this CAMP.

ATTACHMENT A

AIR MONITORING EQUIPMENT CALIBRATION AND MAINTENANCE

All monitoring instruments must be calibrated and maintained periodically. Calibration and on-site maintenance records will be kept in the field log book. The operator must understand the limitations and possible sources of errors for each instrument. It is important that the operator ensures that the instrument responds properly to the substances it was designed to monitor. Portable air quality monitoring equipment that measures total ionizables present such as the RaeSystems MiniRae 2000 (or equivalent) photoionization detector (PID) must be calibrated at least once each day. Combustible gas/oxygen meters (explosimeter) such as the MSA Model 360 monitor must be calibrated at least once a week. Personal Data Ram 1000(s) (PDRs) will be used to monitor particulates. These must be calibrated atleast once a week. The specific instructions for calibration and maintenance provided for each instrument should be followed.

ATTACHMENT B

FORMS FOR HEALTH AND SAFETY-RELATED ACTIVITIES

Note: The OSHA Job Safety and Health Protection Poster must be posted prominently during field activities. The following page is an example of the poster to be used in the field. The actual poster must be an 11 inch by 17 inch size version of this page. The OSHA 300 Log of injuries and illnesses is maintained in the home office of each Langan employee.

You Have a Right to a Safe and Healthful Workplace.

IT'S THE LAW!

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in the inspection.
- You can file a complaint with OSHA within 30 days of discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.

The *Occupational Safety and Health Act of 1970 (OSH Act*, P.L. 91-596) assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act*. The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office: • Atlanta (404) 562-2300 • Boston (617) 565-9860 • Chicago (312) 353-2220 • Dallas (214) 767-4731 • Denver (303) 844-1600 • Kansas City (816) 426-5861 • New York (212) 337-2378 • Philadelphia (215) 861-4900 • San Francisco (415) 975-4310 • Seattle (206) 553-5930. Teletypewriter (TTY) number is 1-877-889-5627. To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website at **www.osha.gov**. If your workplace is in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

1-800-321-OSHA

www.osha.gov

U.S. Department of Labor • Occupational Safety and Health Administration • OSHA 3165

Langan **ACCIDENT REPORT FORM**

Project Name:_____

INJURED OR ILL EMPLOYEE

1. Name _____ Social Security #_____
   (First) (Middle) (Last)
2. Home Address _____
   (No. and Street) (City or Town) (State and Zip)
3. Age _____ 4. Sex: Male ( ) Female ( )
5. Occupation _____
   (Specific job title, not the specific activity employee was performing at time of injury)
6. Department _____
   (Enter name of department in which injured person is employed, even though they may have been temporarily working in another department at the time of injury)

EMPLOYER

7. Name _____
8. Mailing Address _____
   (No. and Street) (City or Town) (State and Zip)
9. Location (if different from mailing address):_____

_____

THE ACCIDENT OR EXPOSURE TO OCCUPATIONAL ILLNESS

10. Place of accident or exposure _____
    (No. and Street) (City or Town) (State and Zip)
11. Was place of accident or exposure on employer's premises? _(Yes/No)
12. What was the employee doing when injured?_____

_____
(Be specific - was employee using tools or equipment or handling material?)

_____

13. How did the accident occur? _____
    (Describe fully the events that resulted in the injury or

_____
occupational illness. Tell what happened and how. Name objects and substances involved.

_____
Give details on all factors that led to accident. Use separate sheet if needed)

14. Time of accident: _____
15. Date of injury or initial diagnosis of occupational illness _____
    (Date)

16. WITNESS TO ACCIDENT

(Name)	(Affiliation)	(Phone No.)
(Name)	(Affiliation)	(Phone No.)
(Name)	(Affiliation)	(Phone No.)

OCCUPATIONAL INJURY OR OCCUPATIONAL ILLNESS

17. Describe the injury or illness in detail; indicate part of body affected.

18. Name the object or substance that directly injured the employee. (For example, object that struck employee; the vapor or poison inhaled or swallowed; the chemical or radiation that irritated the skin; or in cases of strains, hernias, etc., the object the employee was lifting, pulling, etc.)

19. Did the accident result in employee fatality? _____ (Yes or No)
20. Number of lost workdays ____/restricted workdays _____ resulting from injury or illness?

OTHER

21. Did you see a physician for treatment? _____ (Yes or No) _____ (Date)
22. Name and address of physician _____

(No. and Street) (City or Town) (State and Zip)

23. If hospitalized, name and address of hospital _____

(No. and Street) (City or Town) (State and Zip)

Date of report _____ Prepared by _____

Official position _____

PROJECT HEALTH AND SAFETY PLAN

AND WORK PLAN ACCEPTANCE FORM

(For the Langan employees only)

I have read and agree to abide by the contents of the Work Plan and Health and Safety Plan for the following project:

_____	_____
(Project Title)	(Project Number)

Furthermore, I have read and am familiar with the work plan or proposal that describes the field work to be conducted and the procedures to be utilized in the conduct of this work.

Name (print)	Signature	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Place in project Health and Safety File as soon as possible

SITE-SPECIFIC HEALTH AND SAFETY TRAINING

(For All Langan and subcontract employees on site)

I hereby confirm that site-specific health and safety training has been conducted by the site health and safety officer which included:

- Names of personnel responsible for site safety and health
- Safety, health, and other hazards at the site
- Proper use of personal protective equipment
- Work practices by which the employee can minimize risk from hazards
- Safe use of engineering controls and equipment on the site
- Acute effects of compounds at the site
- Decontamination procedures

For the following project:

_____	_____
(Project Title)	(Project Number)

Name (print)	Signature	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Place in project Health and Safety File as soon as possible

ATTACHMENT C

MATERIAL SAFETY DATA SHEETS

- Portland Cement
- Simple Green
- Buffer Solution, pH = 4.00
- Buffer Solution, pH = 7.00
- Buffer Solution, pH = 10.00
- Conductivity Calibration Solution, 10,000 micromhos/cm
- Conductivity Calibration Solution, 1,000 micromhos/cm
- Sodium Hydroxide (aqueous sample preservative)
- Ascorbic Acid (aqueous sample preservative)
- Hydrochloric Acid, 0.01N to 0.2N Solution (aqueous sample preservative)
- Nitric Acid, 0.1N Solution (aqueous sample preservative)
- Trisodium Phosphate
- Acetone
- Premium Unleaded Gasoline
- Motor Oil, 10W-40
- Methane in Air
- Sodium Bentonite
- Compressed Oxygen in Air
- Diesel Fuel
- Isobutylene Gas in Air, 100 ppm

ATTACHMENT D

STANDARD SAFE WORK PRACTICES

1) Eating, drinking, chewing tobacco, smoking and carrying matches or lighters is prohibited in a contaminated or potentially contaminated area or where the possibility for the transfer of contamination exists.

2) Avoid contact with potentially contaminated substances. Do not walk through puddles, pools, mud, etc. Avoid, whenever possible, kneeling on the ground, leaning or sitting on equipment or ground. Do not place monitoring equipment on potentially contaminated surfaces (i.e., ground, etc.).

3) All field crew members should make use of their senses to alert them to potentially dangerous situations in which they should not become involved; i.e., presence of strong and irritating or nauseating odors.

4) Prevent, to the extent possible, spills. In the event that a spillage occurs, contain liquid if possible.

5) Field crew members shall be familiar with the physical characteristics of investigations, including:
   - Wind direction
   - Accessibility to associates, equipment, vehicles
   - Communication
   - Hot zone (areas of known or suspected contamination)
   - Site access
   - Nearest water sources

6) All wastes generated during activities on-site should be disposed of as directed by the project manager or his on-site representative.

7) Protective equipment as specified in the section on personnel protection will be utilized by workers during the initial site reconnaissance, and other activities.

8) Employees shall follow procedures to avoid at-risk behaviors that could result in an incident.

TABLE 2.1
RELEVANT PROPERTIES OF VOCS, METALS, AND SEMIVOLATILES KNOWN OR SUSPECTED AT THE PROPOSED LOCATION OF THE SHOPS AT ATLAS PARK SITE

Compound (Synonym)	OSHA PEL[1] (ppm)	IDLH (ppm)	LEL (%)	Odor Threshold[2] (ppm)	Odor Character	Vapor Pressure (mm Hg)	Physical State	Detectable w/ 10.6 eV lamp PID (I.P. eV)
Benzene	1 5 [STEL]	500 [Ca]	1.2	119	Aromatic, sweet	75	Flammable Liquid	Yes (9.24)
o-,m-, p- Xylenes	100 150 [STEL]	900	0.9	20	Aromatic	7,9,9	Flammable Liquid vapor	Yes (8.4-8.6)
Toluene	200 300 [CEIL]	500	1.1	37	Sweet, pungent Benzene-like	21	Flammable Liquid vapor	Yes (8.82)
Ethyl Benzene	100 125 [TLV-STEL]	800	0.8	0.6	Oily Solvent	7	Flammable Liquid	Yes (8.76)
Lead	0.5 mg/m^3	100 mg/m^3	NA	NA	Odorless	0	Noncombustible Solid	No
Mercury	0.1 mg/m^3	10 mg/m^3	NA	NA	Odorless	0.0012	Silver-White, Heavy Odorless Liquid	No

(1) 29 CFR 1910, June 30, 1993 (8-hour Time weighted average unless otherwise specified.)
(2) ACGIH 1989 Highest reported value of acceptable odor threshold range.
[IDLH] Immediately dangerous to life or health.
[CA] Suspect carcinogen - Minimize all possible exposures.
[STEL] 15 minute Short Term Exposure Limit
[SKIN] Designates that skin is an important possible route of exposure.
[CEIL] Ceiling Limit - not to de exceeded at any time during a work day. - [TLV] Threshold Limit Value.

TABLE 2.1 (CONTINUED)
RELEVANT PROPERTIES OF VOCS, METALS, AND SEMIVOLATILES KNOWN OR SUSPECTED AT THE PROPOSED LOCATION OF THE SHOPS AT ATLAS PARK SITE

Compound (Synonym)	OSHA PEL[1] (ppm)	IDLH (ppm)	LEL (%)	Odor Threshold[2] (ppm)	Odor Character	Vapor Pressure (mm Hg)	Physical State	Detectable w/ 10.6 eV lamp PID (I.P.)	
Polynuclear Aromatic Hydrocarbons (PAH's)	0.2 mg/m^3	80 mg/m^3 [Ca]	varies	varies	varies	very low	Combustible Solid	No	Varies

(1) 29 CFR 1910, June 30, 1993 (8-hour Time weighted average unless otherwise specified.)
(2) ACGIH 1989 Highest reported value of acceptable odor threshold range.
[IDLH] Immediately dangerous to life or health.
[CA] Suspect carcinogen - Minimize all possible exposures.
[STEL] 15 minute Short Term Exposure Limit
[SKIN] Designates that skin is an important possible route of exposure.
[TLV] Threshold Limit Value