

**25-10 38TH AVE.
ASTORIA NY 11102**

Remedial Investigation Report

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REMEDIAL INVESTIGATION REPORT

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LIST OF ACRONYMS

Acronym	Definition
AOC	Area of Concern
CAMP	Community Air Monitoring Plan
COC	Contaminant of Concern
CPP	Citizen Participation Plan
CSM	Conceptual Site Model
DER-10	New York State Department of Environmental Conservation Technical Guide 10
FID	Flame Ionization Detector
GPS	Global Positioning System
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IRM	Interim Remedial Measure
NAPL	Non-aqueous Phase Liquid
NYC VCP	New York City Voluntary Cleanup Program
NYC DOHMH	New York City Department of Health and Mental Hygiene
NYC OER	New York City Office of Environmental Remediation
NYS DOH ELAP	New York State Department of Health Environmental Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PID	Photoionization Detector
QEP	Qualified Environmental Professional
RI	Remedial Investigation
RIR	Remedial Investigation Report
SCO	Soil Cleanup Objective
SPEED	Searchable Property Environmental Electronic Database

CERTIFICATION

I, Michael Veraldi, am a Qualified Environmental Professional, as defined in RCNY § 43-1402(ar). I have primary direct responsibility for implementation of the Remedial Investigation for the Redevelopment Project located at 25-10 38th Avenue Astoria, NY. I am responsible for the content of this Remedial Investigation Report (RIR), have reviewed its contents and certify that this RIR is accurate to the best of my knowledge and contain all available environmental information and data regarding the property.

Qualified Environmental Professional

Date

Signature

EXECUTIVE SUMMARY

The Remedial Investigation Report (RIR) provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy pursuant to RCNY§ 43-1407(f). The remedial investigation (RI) described in this document is consistent with applicable guidance.

Site Location and Current Usage

The Site is located at 25-10 38th Street in the Astoria section of Queens, New York, and is identified as Block 387 and Lot 17 on the New York City Tax Map. Figure 1 shows the Site location. There is a single dwelling on the site which is a one (1) story commercial building with no basement, approximately 4,000-square feet and constructed in 1955. The exterior construction of the building is brick. The interior is divided into an office area, two (2) bathrooms and a warehouse area. The interior is finished with poured concrete floors, sheetrock or concrete block walls and concrete or acoustic tile ceilings. The surrounding properties are mainly commercial business and mixed residential apartment buildings. A map of the site boundary is shown in Figure 2.

Summary of Proposed Redevelopment Plan

The proposed future use of the Site will consist of a new 7-story residential apartment building. The structure will cover approximately 90% of the Lot and includes a cellar beneath the footprint of the building that will contain storage, sanitation, and mechanical equipment rooms. The ground floor will consist of a rear parking area, public entrance vestibule and a commercial/light manufacturing area. Layout of the proposed site development is presented in Figure 3. The current zoning designation is R6A/M1-2 special LIC Mixed use District Dutch Kills Sub-district. The proposed use is consistent with existing zoning for the property.

Summary of Past Uses of Site and Areas of Concern

A Phase I Environmental Assessment was completed by Long Island Analytical Laboratories (LIAL) on or about March 18, 2013 for Lot 17 (25-10-38th St Astoria). LIAL was able to establish a history for the property located to the north directly adjacent to 38th Avenue there is an office building, to the south there are mixed use commercial buildings located on 39th Avenue

to the east there is a commercial building “Liberty Electric and Elevator Supply” located on 27th Street, and to the west there is a residential building located on Crescent Street.

Based upon historic Sanborn Maps, from 1898 through 1970 Lot 17 (25-10 38th Ave Astoria) was a two (2) story residential building. In 1970 the existing building was demolished, the site was improved by a one (1) story building which was used for electric motor and furniture storage. The site usage remained unchanged to the current date.

The AOCs identified for this Site include:

- Historic fill layer is present at the Site from grade to depths less than 1 foot below grade.

Summary of the Work Performed under the Remedial Investigation

Gil Homes Inc. performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed 4 soil borings across the entire project Site, and collected 8 soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed 3 temporary groundwater monitoring wells throughout the Site to establish groundwater flow and collected 3 groundwater samples for chemical analysis to evaluate groundwater quality; and
4. Collected 3 soil vapor samples around site perimeter and collected 3 samples for chemical analysis.

Summary of Environmental Findings

1. Elevation of the property ranges from 34.98 to 37.35 feet.
2. Depth to groundwater ranges from 33.1 to 33.3 feet at the Site.
3. Groundwater flow is generally from north to south beneath the Site.
4. Depth to bedrock is at the Site is greater than 100 feet.
5. The stratigraphy of the Site, from the surface down, consists of less than one foot of historic fill material underlain by native brown silty sand.
6. Soil/fill samples collected during the RI showed trace concentrations of acetone and PCE in one sample each. No VOCs were detected at concentrations above NYSDEC Unrestricted Use and/or the Restricted Residential Use Soil Cleanup Objectives. PCBs

were not detected in any of the soil/fill samples. Semi-Volatile Organic (SVOC) hydrocarbons including benzo-(b)fluoranthene (maximum of 1,320 ppb), chrysene (maximum of 1,120 ppb), and indeno(1,23-cd)pyrene (maximum of 784 ppb) exceeded Restricted Residential Use SCOs in two shallow soil samples. All other SVOCs were well below Unrestricted Use SCOs. Two pesticides including 4,4-DDE (maximum of 6.39 ppb), and 4,4-DDT (maximum of 11.5 ppb) slightly exceeded Unrestricted Use SCOs, at levels well below their Restricted Residential SCOs. Two metals including lead (maximum of 297 ppm) and mercury (maximum of 0.44 ppm) exceeded Unrestricted Use SCOs in several soil samples. All other metal results were below Unrestricted Use SCOs. Overall, the findings of soil quality were unremarkable and do not point to any disposal conditions.

7. Groundwater samples collected during the RI showed no detection or exceedances of the NYSDEC 6NYCRR Part 703.5 Groundwater Quality Standards (GQS) for VOCs, PCBs, or pesticides. Several metals were detected in groundwater and only sodium exceeded its GQS.

8. Soil vapor samples collected during the RI showed thirteen (13) VOCs were detected at varying concentrations. Most compounds were detected at concentrations less than 25 $\mu\text{g}/\text{m}^3$ except for acetone at 130 ug/m^3 and Dichlorodifluoromethane at 290 ug/m^3 . Chlorinated VOCs including tetrachloroethylene (PCE) was detected at a concentration of 150 $\mu\text{g}/\text{m}^3$ in one of three soil vapor samples. 1,1,1-Trichloroethane was detected at a concentration of 6.0 $\mu\text{g}/\text{m}^3$. TCE and carbon tetrachloride were not detected in any soil vapor samples. The PCE concentrations are within the monitoring level ranges established within the State DOH soil vapor guidance matrix.

REMEDIAL INVESTIGATION REPORT

1.0 SITE BACKGROUND

Gil Homes intends to enroll in the New York City Voluntary Cleanup Program (NYC VCP) to investigate and remediate the 4,000sq/ft. site located at 25-10 38th Avenue Astoria New York. Residential use is proposed for the property. The RI work was performed between March 7, 2013, and August 31, 2013. This RIR summarizes the nature and extent of contamination and provides sufficient information for establishment of remedial action objectives, evaluation of remedial action alternatives, and selection of a remedy that is protective of human health and the environment consistent with the use of the property pursuant to RCNY§ 43-1407(f).

1.1 Site Location and Current Usage

The Site is located at 25-10 38th Avenue Astoria, New York, and is identified as Block 387 and Lot 17 on the New York City Tax Map. Figure 1 shows the Site location. The Site is 4,000-square feet and is bounded to the north directly adjacent to 38th Avenue by an office building, to the south there are mixed use commercial buildings located on 39th Avenue, to the east there is a commercial building “Liberty Electric and Elevator Supply” located on 27th Street, and to the west there is a residential building located on Crescent Street. Currently the site is vacant.

1.2 Proposed Redevelopment Plan

The proposed future use of the Site will consist of a new 7-story residential apartment building with 19 apartments. The structure will cover approximately 75% of the Lot and includes a cellar beneath the footprint of the building which will be utilized for a gym, accessory recreation space, bicycle storage, laundry and meter rooms. Layout of the proposed site development is presented in Figure 3. The current zoning designation is R6A/M1-2. The proposed use is consistent with existing zoning for the property.

1.3 Description of Surrounding Property

The area surrounding the Site consists of a mix of residential, industrial and vacant properties. Figure 4 shows the surrounding land usage of the adjacent properties listed below as well as additional properties located in the general area of the subject site.

Surrounding Property Usage

Direction	Property Description
North – Adjacent to 38 th Ave	Office building
South – Adjacent property	Mixed residential and commercial building.
East – Adjacent Property	Commercially developed lots with industrial/manufacturing properties.
West – Adjacent Property	Residential building

2.0 SITE HISTORY

2.1 Past Uses and Ownership

A Phase I Environmental Assessment was completed by Long Island Analytical Laboratories Inc. (LIAL) for Lot 17 (25-10 38th Ave Astoria NY). LIAL was able to establish a history for Lot 17 dating back to 1898 when the site was improved for residential usage. From 1955 through 1960 the Lot was used for retail sales only. Sometime after 1960 the site was used for electric motor services up until 1970. From 1970 up until June of 2012 the site was used as warehouse storage. The site has been vacant since June of 2012.

Based upon historic Sanborn Maps, the subject building was constructed sometime between 1950 and 1970 and had been used for Electric Motor Services. The site was originally developed sometime prior to 1898 for residential purposes.

2.2 Previous Investigations

LIAL has not been made aware of any previous subsurface investigations conducted at the Site.

2.3 Site Inspection

Ms. Diane Hawran of Long Island Analytical Laboratories Inc. (LIAL) performed the site inspection on March 7, 2013. The reconnaissance included a visual inspection of the Site, the sidewalk immediately in front of the Site, and the exterior of adjacent properties. At the time of the inspection, the Site consisted of a vacant commercial warehouse with office space.

2.4 Areas of Concern

The AOCs identified for this Site include:

- Historic fill layer is present at the Site from grade to depths less than 1 foot below grade.

A copy of the Phase 1 Report is presented in Attachment A.

3.0 PROJECT MANAGEMENT

3.1 Project Organization

The Qualified Environmental Profession (QEP) responsible for preparation of this RIR is Michael Veraldi

3.2 Health and Safety

All work described in this RIR was performed in full compliance with applicable laws and regulations, including Site and OSHA worker safety requirements and HAZWOPER requirements.

3.3 Materials Management

All material encountered during the RI was managed in accordance with applicable laws and regulations.

4.0 REMEDIAL INVESTIGATION ACTIVITIES

Gil Homes performed the following scope of work:

1. Conducted a Site inspection to identify AOCs and physical obstructions (i.e. structures, buildings, etc.);
2. Installed 4 soil borings across the entire project Site, and collected 8 soil samples for chemical analysis from the soil borings to evaluate soil quality;
3. Installed 3 temporary groundwater monitoring wells throughout the Site to establish groundwater flow and collected 3 groundwater samples for chemical analysis to evaluate groundwater quality; and
4. Installed 3 soil vapor probes around Site perimeter and collected 3 samples for chemical analysis.

4.1 Geophysical Investigation

A geophysical investigation was performed as a part of this assessment and no sub-surface anomalies were identified.

4.2 Borings and Monitoring Wells

Drilling and Soil Logging

On June 7, 2013, a total of four soil borings (SB1 through SB4) were performed at the 25-10 38th Avenue Astoria NY. The four soil borings were chosen to gain representative soil, groundwater, and soil vapor quality information across the Lot. Soil samples were collected continuously from grade to a maximum depth of 10 feet below grade, using a five-foot steel macro-core sampler with acetate liners and Geoprobe direct-push equipment. Soil recovered from each of the soil borings was field screened for the presence of VOCs with a photo-ionization detector (PID) and visually inspected for evidence of contamination. No PID readings above background concentrations were obtained from any of the soil borings.

One sample was retained from each soil boring representing the interval 0 to 2 feet below grade, and one soil sample was retained from each soil boring representing the interval 8 to 10 feet below grade with the exception of SB-2 where one soil sample was secured from the 0-2' interval and one from the 2-4, interval. Soil boring details are provided in Table 1.

Boring logs were prepared by a Qualified Environmental Professional and are attached in Attachment B. A map showing the location of soil borings and monitor wells is shown in Figure 5.

Groundwater Monitoring Well Construction

A temporary 1-inch diameter PVC monitoring well with 10 feet of 0.010 slot screen was installed at boring locations GW-1, GW-2 and GW-3 set to intersect the water table. Since groundwater was encountered at approximately 33 feet below grade, monitoring wells were installed to a depth of 43 feet. Monitoring well sampling details are provided in Table 1. Monitoring well locations are shown in Figure 5.

Survey

Soil borings and wells were located to the nearest 0.10 foot with respect to two or more permanent site features.

Water Level Measurement

Approximate groundwater level measurements were collected using a Solinst oil/water interface meter to ensure the surface of the water table was within the screened section of the monitoring well. No free product was observed, no petroleum sheen was observed within the three monitoring wells. Water level data is included in Table 1.

4.3 Sample Collection and Chemical Analysis

Sampling performed as part of the field investigation was conducted for all Areas of Concern and also considered other means for bias of sampling based on professional judgment, area history, discolored soil, stressed vegetation, drainage patterns, field instrument measurements, odor, or other field indicators. All media including soil, groundwater and soil vapor have been sampled and evaluated in the RIR. Discrete (grab) samples have been used for final delineation of the nature and extent of contamination and to determine the impact of contaminants on public health and the environment. The sampling performed and presented in this RIR provides sufficient basis for evaluation of remedial action alternatives, establishment of a qualitative human health exposure assessment, and selection of a final remedy.

Soil Sampling

Eight soil samples were collected for chemical analysis during this RI. Data on soil sample collection for chemical analyses are reported in Tables 2 through 5. Figure 5 shows the location of samples collected in this investigation. Laboratories and analytical methods are shown below.

The 8 soil samples were collected in pre-cleaned, laboratory supplied glassware, stored in a cooler with ice and submitted for analysis to Long Island Analytical Laboratories of 110 Colin Drive Holbrook, NY 11741, a New York State ELAP certified environmental laboratory (ELAP Certification No. 11693). All soil samples were analyzed for the presence of volatile organic compounds (VOCs) by EPA Method 8260, semi-volatile organic compounds (SVOCs) by EPA Method 8270, pesticides/PCBs by EPA Methods 8081/8082 and target analyte list (TAL) metals.

Groundwater Sampling

Three groundwater samples were collected for chemical analysis during this RI. Groundwater samples were collected by installing a one-inch diameter PVC well, 5-feet below the water table interface (set at approximately 33 feet below grade). A groundwater sample was then collected from each temporary well utilizing dedicated polyethylene tubing, and a peristaltic pump. Groundwater samples were collected in pre-cleaned, laboratory supplied glassware, stored in a cooler with ice and submitted to Phoenix for analysis of VOCs by EPA Method 8260, SVOCs by EPA Method 8270, pesticides/PCBs by EPA Methods 8081/8082 and TAL metals. Groundwater sample collection data is reported in Tables 6 through 10. Sampling logs with information on purging and sampling of groundwater monitor wells are included in Attachment C. Figure 5 shows the location of groundwater sampling. Laboratories and analytical methods are shown below.

Soil Vapor Sampling

Three soil vapor probes, SV-1 through SV-3, were installed at 25-10 38th Avenue samples were collected for chemical analysis during this RI. Soil vapor sampling locations are shown in Figure 5. Soil vapor sample collection data is reported in Table 11. Methodologies used for soil vapor assessment conform to the *NYS DOH Final Guidance on Soil Vapor Intrusion, October 2006*.

The three soil vapor implants located at 25-10 38th Avenue were installed using Geoprobe™ equipment and tooling. The approximate location of each of the soil vapor implants is shown on Figure 5. The vapor implants that were installed were the Geoprobe™, which are constructed of a 6-inch length of double woven stainless steel wire. The implants were installed to a depth of 7 feet below grade at all locations. Each implant was attached to ¼ inch polyethylene tubing which extended approximately 18 inches beyond that needed to reach the surface. The tubing was capped with a ¼ inch plastic end to prevent the infiltration of foreign particles into the tube. Coarse sand was placed around the vapor implant to a height of approximately 1 foot above the bottom of the implant. The remainder of the borehole was sealed with a bentonite slurry to the surface.

The two sub-slab soil vapor implants were installed by drilling a 1/2 inch hole through the cellar and sub-cellar concrete slab with a handheld drill and then inserting 1/4 inch polyethylene tubing to no more than 2 inches below the base of the slab. The tubing was then sealed at the surface with hydrated granular bentonite.

Soil vapor sampling for the three implants installed on June 7, 2013. Prior to sampling, each sampling location was tested to ensure a proper surface seal had been obtained. In accordance with NYSDOH guidance (NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, February 2005), a tracer gas (helium) was used as a quality assurance/quality control device to verify the integrity of the sampling point seal prior to collecting the samples. Prior to testing and collecting samples, the surface immediately surrounding the polyethylene tubing of the vapor implant was sealed using a 1 foot ft by 1 ft square sheet of 2 mil HDPE plastic firmly adhered to a wetted layer of granular bentonite. The seal was then tested by enriching the air space above the seal with a tracer gas (helium) while continuously monitoring air drawn from the implant with a helium detector (Dielectric Model MGD-2002, Multi-Gas Detector) for a minimum of 15 minutes. The tracer gas test procedure was employed at all 5 soil vapor sampling locations. No surface seal leaks were observed at any of the locations.

Following verification that the surface seal was tight, one to three volumes (i.e., the volume of the sample probe and tube) of air was purged from the implant using a calibrated vacuum pump. After purging, a 6-liter Summa® canister, fitted with a 2-hour flow regulator, was attached to the surface tube of each of the 3 vapor implants. Prior to initiating sample collection, sample identification, canister number, date and start time were recorded on tags attached to each canister via a tag provided by the laboratory. Sampling then proceeded by fully opening the flow control valve on each canister in turn. Immediately after opening the flow control valve on a canister, the initial vacuum (inches of mercury) was recorded in the field book and on the sample tag. When the vacuum level in the canister was between 5 and 8 inches of mercury (approx 2 hours), the flow controller valve was closed, and the final vacuum recorded in the field notebook and on the sample tag.

The soil gas Sample identification, date, start time, start vacuum, end time and end vacuum were recorded on tags attached to each canister and on a sample log sheet (Attachment E). Samples were submitted to Phoenix for laboratory analysis of VOCs EPA Method TO-15.

Chemical Analysis

Chemical analytical work presented in this RIR has been performed in the following manner:

Factor	Description
Quality Assurance Officer	The chemical analytical quality assurance is directed by Long Island Analytical Laboratories
Chemical Analytical Laboratory	Chemical analytical laboratory(s) used in the RI is NYS ELAP certified and was Long Island Analytical Laboratories
Chemical Analytical Methods	Soil analytical methods: <ul style="list-style-type: none"> • TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000); • PCBs by EPA Method 8082A (rev. 2000); Groundwater analytical methods: <ul style="list-style-type: none"> • TAL Metals by EPA Method 6010C (rev. 2007); • VOCs by EPA Method 8260C (rev. 2006); • SVOCs by EPA Method 8270D (rev. 2007); • Pesticides by EPA Method 8081B (rev. 2000); • PCBs by EPA Method 8082A (rev. 2000); Soil vapor analytical methods: <ul style="list-style-type: none"> • VOCs by TO-15 VOC parameters.

Results of Chemical Analyses

Laboratory data for soil, groundwater and soil vapor are summarized in Tables 2 through 11, respectively.

5.0 ENVIRONMENTAL EVALUATION

5.1 Geological and Hydrogeological Conditions

Stratigraphy

Subsurface soil at the Site consisted of historic fill, which was primarily comprised of brick, concrete, wood and other debris in a brown silty-sand matrix. The layer of historic fill extended to a depth ranging from ground surface to less than one foot below grade. Native soil consisting of a brown, silty sand is present below the historic fill layer.

Hydrogeology

A table of water level data for all monitor wells is included in Table 1. The average depth to groundwater is 33 feet below grade and the range in depth is 33.10 feet to 33.33 feet. It has been determined that the general Groundwater flow on the subject site is predominately from the north to the south. However, it should be noted that the direction of Groundwater flow may vary throughout the subject site.

5.2 Soil Chemistry

Data collected during the RI is sufficient to delineate the vertical and horizontal distribution of contaminants in soil/fill at the Site. A summary table of data for chemical analyses performed on soil samples is included in Tables 2 through 5. Results were compared to NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs) and Restricted Residential Soil Cleanup Objectives (RRSCO) as presented in 6NYCRR Part 375-6.8 and CP51. A copy of the laboratory report is provided in Attachment E. Figure 6 shows the location and posts the values for soil/fill that exceeds UUSCOs and RRSCO.

Soil/fill samples collected during the RI showed trace concentrations of acetone and PCE in one sample each. No VOCs were detected at concentrations above NYSDEC Unrestricted Use and/or the Restricted Residential Use Soil Cleanup Objectives. PCBs were not detected in any of the soil/fill samples. Semi-Volatile Organic (SVOC) hydrocarbons including benzo(b)fluoranthene (maximum of 1,320 ppb), chrysene (maximum of 1,120 ppb), and indeno(1,23-cd)pyrene (maximum of 784 ppb) exceeded Restricted Residential Use SCOs in two shallow soil samples. All other SVOCs were well below Unrestricted Use SCOs. Two pesticides including 4,4-DDE (maximum of 6.39 ppb), and 4,4-DDT (maximum of 11.5 ppb) slightly exceeded Unrestricted Use SCOs, at levels well below their Restricted Residential SCOs. Two metals including lead (maximum of 297 ppm) and mercury (maximum of 0.44 ppm) exceeded Unrestricted Use SCOs in several soil samples. All other metal results were below Unrestricted Use SCOs. Overall, the findings of soil quality were unremarkable and does not point to any disposal conditions.

5.3 Groundwater Chemistry

Data collected during the RI is sufficient to delineate the distribution of contaminants in groundwater at the Site. A summary table of data for chemical analyses performed on groundwater samples is included in Tables 6 through 10.

Groundwater samples collected during the RI showed no detection or exceedances of the NYSDEC 6NYCRR Part 703.5 Groundwater Quality Standards (GQS) for VOCs, PCBs, or pesticides. Several metals were detected in groundwater and only sodium exceeded its GQS.

5.4 Soil Vapor Chemistry

Data collected during the RI is sufficient to delineate the distribution of contaminants in soil vapor at the Site. A summary table of data for chemical analyses performed on soil vapor samples is included in Table 11.

Soil vapor samples collected during the RI showed thirteen (13) VOCs were detected at varying concentrations. Most compounds were detected at concentrations less than 25 $\mu\text{g}/\text{m}^3$ except for acetone at 130 $\mu\text{g}/\text{m}^3$ and Dichlorodifluoromethane at 290 $\mu\text{g}/\text{m}^3$. Chlorinated VOCs including tetrachloroethylene (PCE) was detected at a concentration of 150 $\mu\text{g}/\text{m}^3$ in one of three soil vapor samples. 1,1,1-Trichloroethane was detected at a concentration of 6.0 $\mu\text{g}/\text{m}^3$. TCE and carbon tetrachloride were not detected in any soil vapor samples. The PCE concentrations are within the monitoring level ranges established within the State DOH soil vapor guidance matrix.

5.5 Prior Activity

Based on an evaluation of the data and information from the RIR, disposal of significant amounts of hazardous waste is not suspected at this site.

5.6 Impediments to Remedial Action

There are no known impediments to remedial action at this property.

