Interim Remedial Measure (IRM) Work Plan – Vapor Mitigation

Site Name: 18 Division Place (224211)

14-18 Division Place, 275-283 Richardson Street Brooklyn, New York, 11222

November 29, 2022
Last Revised December 14, 2022
Prepared for:

18 Division Place Corp.
33 Dobbin Street
Brooklyn, New York 11222

Prepared by:

EQUITY ENVIRONMENTAL ENGINEERING, LLC
500 International Drive, Suite 150 Mount Olive, New Jersey 07828 (973) 527-7451

CPEngineering, PC
1732 1st Avenue ##26135 NY NY 10128

Table of Contents

FIGURES

1. INTRODUCTION

CPEngineering, PC (CPE) in conjunction with Equity Environmental Engineering, LLC (Equity) prepared this Interim Remedial Measure (IRM) Work Plan on behalf of 18 Division Place Corp. (the "DPC" or the "Applicant"). The Site (referred to herein as the "Site" or "18 Division Place"), is located at 18 Division Place in the Greenpoint/East Williamsburg Industrial Area of Brooklyn, New York (see Figure 1) and is comprised of four tax parcels, Block 2489 Lots 9, 10, 21, and 24.

In this IRM, DPC proposes to evaluate via pilot testing with a subsequent design for the Site with a sub slab depressurization system (SSDS) capable of providing negative differential pressure under the building. A function of the negative pressure is to have the contaminated vapor collected and discharged to the atmosphere via piping to the roof of the Site. The IRM is a component of the overall remedial objectives from NYSDEC. This objective will primarily be achieved through the design and installation of an active SSDS system with proposed negative pressure fans located on the roof.

The Site is currently used as a contractor storage yard and other commercial uses. Lot 9 is a vacant lot with no current operations. Lot 10 is occupied by various commercial tenants for use as contractor storage and offices. Lots 21 and 24 are occupied by NY Imports DS and NY Metal Import, respectively. There is currently no proposed post-remedial change in Site use, as the owner anticipates continuing the current use and occupancy of the Site.

DPC, the recent purchaser of the Site, entered the BCP as a 'Volunteer' on February 4, 2022 as per Brownfield Cleanup Agreement Index No. C224211-11-21 (the "BCA"). This IRM was developed in accordance with the DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010 (DER-10) and New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, updated May 2017.

2. Background

This section describes the Site, summarizes the Site operational and regulatory history, and documents the Site environmental setting.

2.1 Site Description

The 0.67-acre Site is located in the Greenpoint/East Williamsburg Industrial Area section of Kings County. The Site consists of properties with the following addresses: 14 Division Place (Block 2489, Lot 9), 18 Division Place (Block 2489, Lot 10), 275 Richardson Street (Block 2489, Lot 24), and 283 Richardson Street (Block 2489, Lot 21). All four parcels are zoned light industrial (M1-1) and are used for commercial purposes with the exception of a two-story residential house located on Lot 10. Nearly the entirety of the Site is covered by buildings, with a total of 18,900 square feet of building footprint on the four parcels, compared to a total lot size of 25,640 square feet within the four parcels collectively. The buildings were all constructed circa 1920, based on the New York City Planning Department's Zoning and Land Use Map (ZoLA). None of the commercial buildings have a cellar (2 story house has a 6' basement), and all are one-story except for a two-story building at 18 Division Place. The two-story residential building located on Lot 10 has a cellar. Only the

narrow parcel at 14 Division Place and the southern third of the 275 and 283 Richardson Street properties are not covered by buildings. Where not covered by buildings, the open areas are primarily broken asphalt with partial pavement (specifically the vacant lot to the west of 14 Division Place and the asphalt yard behind the residential building at 18 Division Place.

Surrounding Property

A property adjacent to the southeastern boundary of the Site, which is known as 291 Richardson Street (Block 2489, Lot 120) was at one time a portion of the former Goodman Brothers facility that also included the Site. However, environmental investigation and remediation at Block 2489, Lot 120 is being completed by others under a separate BCA (C224292). This IRM does not include activities at 291 Richardson Street.

The Site is located in a mixed commercial and residential use area. On its north and south, the Site is bordered by the rights of way for Richardson Street and Division Place, respectively. Across Richardson Street from the Site are vacant lots, a multi-unit residential building, buildings used for warehousing or storage, and what appears to be a motorcycle repair business. To the west of the Site is a row of two-story residential properties that front the eastern side of Kingsland Avenue. These properties are multi-unit residential buildings that were constructed in 1930, according to ZoLA. At the southern end of the row of residential buildings, at the northeastern corner of the intersection of Richardson Street and Kingsland Avenue, is a parking lot surrounded by a gated chain link fence. To the north of the Site, across Division Place, are primarily commercial properties, including a dry cleaner business at the northeastern corner of the intersection of Kingsland Avenue and Division Place, a parking lot, an office building, and a business known as Pirate Studios, which rents space for bands to play music indoors. A multi-unit residential building is also present at 17 Division Place. To the east of the Site is a multi-unit residential property at the southwestern corner of Richardson Street and Debevoise Avenue and a mixed-use commercial and residential building at the southwestern corner of the intersection of Debevoise Avenue and Division Place.

2.2 Site Operational History

According to the Goodman Brothers Steel Drum Draft Upland Site Summary (DUSS) document (Ref #7) that was prepared by Anchor QEA and is dated May 2012, the property at 18 Division Place was purchased by Fannie, Morris, and Bessie Goodman in 1911. Property ownership is listed as B&F Goodman Associates as of 1967, and this entity owned the property until at least 2004. In 1972, adjacent parcels were purchased; as the DUSS indicates that these purchases increased "their property southward to Richardson Street," it is believed that Lots 21 and 24 were purchased in 1972 while at least Lot 10 was purchased in 1911. In 2004, the property was purchased by the most recent prior owners, Richland Properties, Inc. and King Tower Properties, Inc. Richland Properties, Inc. owned 275 and 283 Richardson Street, while King Tower Properties, Inc. owned 14 and 18 Division Place. The properties owned by both entities were purchased recently by the current owner, 18 Division Place Corp.

During the period of ownership of the property by Fannie, Morris, and Bessie Goodman and later by B&F Goodman Associates, the Goodman Brothers Steel Drum Company or its predecessor operations were situated at the Site. Barrels were stored at the Site as early as 1933. Drum re-conditioning and recycling operations are believed to have continued from at least this time through

circa 2002, when the business stopped operating because, according to the DUSS, "the company could not then compete with similar steel drum refurbishing facilities in New Jersey". More recent sources indicate that the Goodman Brothers Steel Drum Company or its predecessors may have begun operations at the 18 Division Place property as early as 1909 or even 1904 and that the operations may not have ceased until 2004. Regardless of the precise dates of operation, it appears that the Goodman Brothers Steel Drum Company and its predecessor companies operated at the Site to store, re-condition, and recycle containers, including drums for most of the 20th century.

2.3 Site Regulatory History

Environmental investigations have been conducted at the Site beginning in 1983, when the Goodman Brothers Steel Drum Company signed a Consent Order with the United States Environmental Protection Agency (US EPA). In 1987 and 2003, the Goodman Brothers Steel Drum Company entered into consent orders with the NYSDEC (Ref #8, Ref #9).

Initial investigations of environmental media at the Site included soil and soil vapor sampling starting in the early 1990s and then a soil and groundwater investigation completed under a RCRA Facility Closure Plan circa 2003. Data collected as part of the Meeker Avenue Plume Trackdown Site Characterization (Site ID No. 224121) was used to list the Goodman Property as a Class 2 Inactive Hazardous Waste Site in 2015 as NYSDEC Site ID 224211.

2.4 Site Environmental Setting

This section reviews the geological and hydrogeological conditions in the vicinity of the Site and identifies potential receptors. Where referenced, the information is from the Site Characterization Report, Phase IX, Site 224121, prepared by "URS Corporation for NYSDEC" dated December 2016 (Ref #4). Additional information was referenced from "Former Goodman Brothers Steel Drum Company Data Summary Report, C224211, dated January 2020 (Ref #6). Other sources are noted where applicable.

Site Geology

Geology at the Site is primarily comprised of, from the land surface downwards, two to 10 feet of fill material that is underlain by at least 105 feet of interbedded strata and lenses of clay, silt, sand, and gravel, which in turn is underlain by low permeability clays of the Raritan Formation. The deposits between the fill and the Raritan Formation are glacial in origin, with some strata being fine-grained glacial lake deposits, some being coarser grained glaciofluvial deposits, and some being till deposits that were subsequently partially eroded. The Raritan Formation is described as a gray to white clay with lenses of sand.

Site Hydrogeology

Despite the heterogeneity of the subsurface strata, the hydrogeology is relatively simple at a large scale. The nearest surface water body is Newtown Creek, which is a tidally influenced tributary to the East River. Newtown Creek itself is located between ½ and ¾ miles to the east-northeast of the Site. Smaller engineered channels that branch off from Newtown Creek are present to the east and southeast of the Site, with the nearest channel being approximately ½ mile to the east-southeast of the Site. The hydraulic gradient at the Site is generally towards the east to east-northeast.

The depth to groundwater at the Site on July 29, 2019 was approximately 15 to 22 feet below grade. Based upon classifications associated with the Meeker Street Plume investigation, monitoring wells have been classified as shallow or deep. Shallow monitoring wells are typically, although not universally, screened across the water table. The bottom of the screened interval in shallow monitoring wells is typically at elevations between 22 and 0 feet above mean sea level (AMSL)), while the deep monitoring wells are typically screened at elevations between 0 and -25 feet AMSL. At the Site, there are no continuous low permeability aquitards between the water bearing zones screened by the shallow and deep wells. Furthermore, hydraulic head readings indicate that there is minimal vertical hydraulic head change between the shallow and deep monitoring wells, and the horizontal components of the hydraulic gradient are generally the same (i.e., towards the southeast to northeast). As such, the glacial deposits can be considered to be a single hydrostratigraphic unit, with groundwater flow being primarily through the coarser sand and gravel deposits. While some groundwater flow may occur through the finer-grained silt and clay deposits, most of the flow will be around the silt and clay layers. Additionally, any contaminant mass that seeps into the fine-grained deposits is likely to be released slowly as equilibrium conditions change in the sand.

Based on groundwater elevation measurements made on July 29, 2019 (Data Summary Report, January 2020), the hydraulic gradient in the shallow water bearing zone is approximately 0.035 feet per foot. At the Site itself, there is an even lower hydraulic gradient, and most of the groundwater elevation change was measured in wells east of Debevoise Avenue. In the deep groundwater, based on July 29, 2019 measurements, the horizontal component of the hydraulic gradient is approximately 0.025 feet towards the east to east-northeast. As with the vertical hydraulic gradient, the similarity between the hydraulic gradients in the shallow and deep groundwater zones confirm that the glacial deposits are working as a single hydrogeologic unit.

3. IRM Work Plan

3.1 – Pilot Study

In support of the proposed SSDS design, CPE will perform a pilot study at the Site to determine subsurface conditions with respect to the functionality required for the SSDS system. The overall goal of the pilot study is to determine if "communication" is possible beneath the existing slabs. For the purposes of the pilot study, a water column pressure reading of -0.02 inches will suggest such "communication" has been achieved. Where noted during the field activities, each individual slab will be pilot tested individually including a separate pilot study at the residential property basement. The condition of all slabs will be documented and provided in the pilot study report.

3.1.1- Slab Preparation

Prior to the pilot study, any exposed portions of the sub-slab will be inspected for potential deficiencies (e.g. cracks, joints, penetrations, etc.). All accessible deficiencies identified as having a potential to influence sub-slab depressurization will be sealed using urethane sealant. Large penetrations will be filled with concrete and sealed with urethane sealant. Openings or cracks that

exist where the slab meets the foundation wall (floor-wall joint), will be sealed with urethane caulk or equivalent material. When the opening or channel is greater than 0.50 inches in width, a foam backer rod or other comparable filler material will be inserted into the channel before application of the sealant.

3.1.2 – Diagnostics

Upon completion of slab preparation, DPC will investigate diagnostic measurements and system design concepts by coring 2 ½" suction holes in the concrete floors and 5/16" test holes at various distances from the suction holes. A 10' ring will be used as the standard step out distance from each suction point. A specialized Sub Slab Diagnostic Vacuum (SSDV), capable of up to 200 cfm and a vacuum of 100 inches of water column ("w.c.) will be used with a variable speed controller to define the flow and vacuum characteristics of the soil beneath the slab. The data obtained during the diagnostic investigation will be summarized in tables.

The range of applied vacuum and flow rate used for each suction point will be determined by evaluating the baseline data taken in the maximum flow and vacuum test performed at the beginning of each sampling series. The number of test point locations at each suction point will be determined based on the results of the first sampling series at that location. The data collected at each suction point series includes; maximum vacuum and airflow at the suction point, vacuum 10 and 25 feet away from the suction point (SSP1), vacuum at each test point at multiple vacuum speeds or flow rates, the distance each test point is from the suction point, and the speeds that each series run.

The results of the pilot study will be used to adjust locations of the proposed SSDS pits or SSDS fan horsepower selections.

3.2 –SSDS Design Report/Drawings

Following the review and results of the pilot study, Equity and CPE will prepare a Sub Slab Depressurization Design Report and engineering drawings.

The system is anticipated to include multiple sump style extraction points with manifolds to roof mounted suction fans. Full design details will be provided in the design report, including equipment specifications, installation details, and code requirements.

A separate SSDS or other mitigative design will be provided for the residential property.

All components of the SSDS units will be designed in compliance with the applicable mechanical, electrical, building, plumbing, energy and fire prevention codes, standards, and regulations of the local jurisdiction.

A Operation, Maintenance, and Monitoring Plan will also be included with the design package.

Per NYSDOH "Guidance on Air Emissions of VOCs at DER Remediation Sites". Calculations will be performed in anticipation of compliance with Part 212-2.1 for the primary constituents of concern.

4. SYSTEM CONFIRMATION TESTING

Once installation of the sub-slab vapor mitigation system has been completed, post installation system testing will be conducted by the installation contractor pursuant to Section 4.3.1 of the NYSDOH Guidance for Evaluating Soil Vapor Intrusion. Results from these tests will be documented and subsequently provided to NYSDEC and NYSDOH. In general, this testing will be conducted to confirm that all SSD units were installed and are functioning properly. More specifically, the installation contractor will reexamine and verify the integrity of the fan mounting seals and all joints in the interior vent piping, and will measure suctions and flows in system piping or ducting to assure that the system is operating as designed. The installation contractor will also check the vacuum achieved at each test hole by using a digital micromanometer.

The specific post installation tests to be performed immediately after all SSD units have been installed and activated will include the following:

1) smoke tests to identify potential leaks;
2) initial pressure field extension tests;
3) confirmation of the proper operation of warning devices (i.e., alarms); and verification of proper system-wide labeling.

4.1 Post Mitigation Indoor Air Testing

Following the installation of the sub-slab vapor mitigation system, indoor air sampling will be performed to collect indoor air concentrations.

A total of six (6) indoor air samples will be collected at the following locations

1. 14 Division Place (Tenant space) – One (1) indoor air sample
2. 18 Division Place (main building) – Two (2) indoor air samples
3. Ecko Flooring (tenant space) – One (1) indoor air sample
4. 18 Division Place Residential Property – Two (2) indoor air samples (cellar and first floor).

All samples will be collected no sooner than thirty (30) days following system start up, within the heating season, if possible.

If the system is installed outside of the heating season, post mitigation air sampling will be required and will be repeated during the heating season.

5. COMMUNITY AIR MONITORING PLAN (CAMP)

A Community Air Monitoring Plan (CAMP) will be performed during all work activities, per NYSDOH Generic CAMP with Special Requirements for work within 20 feet of Potentially Exposed Individuals or Populations or Structures and Special Requirements for Indoor Work with co-located Residences and Facilities. Appendix A provided the baseline CAMP requirements for this Site. DPC proposes to establish site specific CAMP action exceedance values prior to the start of work with NYSDOH. DPC will provide to NYSDEC and NYSDOH on a weekly basis a report of CAMP values. Within 24 hours, NYSDOH will be notified of a daily specific exceedances of the established action levels and a summary of all corrective measures taken per exceedance.

DPC will collect background readings prior to the start of each work day, which will be shared with NYSDEC and NYSDOH as a component of the Daily Field Reports. These background and upwind readings will establish exceedance action levels.

6. ANTICIPATED PROJECT SCHEDULE

Upon completion of the pilot study, the SSDS design document and drawings will be prepared within 60 days for submittal to NYSDEC and NYSDOH.

Upon completion of the pilot studies, SSDS design documents and installation of the systems will proceed as soon as possible pending agency review and approvals. The residential property will be addressed immediately upon all approvals. Any required modifications to the final schedule will be reported in monthly progress reports.

7. REPORTING

Upon completion of all installation and preliminary testing tasks, a Construction Completion Report (CCR) will be prepared and submitted to NYSDEC and NYCDOH. An Operation, Maintenance, and Monitoring Report will also be included with the CCR package.

The CCR will document all pilot study testing, installation specification, final design, deviations, installation, startup, and operational status of the mitigation system.

8. KEY PROJECT PERSONNEL

We propose the following key personnel and subcontractors for this work. Key personnel Resumes are provided in Appendix D. Field team personnel will be assigned based on their availability and their experience with the required fieldwork.

- Remedial Engineer – Craig Puerta, PE: Mr. Puerta has over 20 years of experience completing environmental investigations and remedial actions in New York and his company, CPEngineering, will be providing all final engineering certifications, supervision, and principle in charge activities.
- Project Manager – Robert Jackson, PE: Mr. Jackson has over 30 years of experience completing environmental investigations and remedial actions in New York. His experience includes planning and oversight for all activities proposed in this RIWP.

- Field Team Lead – John Vrabel: John has approximately 10 years of experience conducting a variety of environmental investigations in New York. His experience includes drilling hundreds of soil borings, installing hundreds of monitoring wells, completing oversight of subcontractors, and collecting thousands of samples of various environmental media.
- Site H&S Officer – Faron Moser, CHST: Mr. Moser has over 15 years of experience in health and safety program design, implementation, and audit and in completing environmental investigations. He is a Certified H&S Trainer, and routinely assists Equity's clients in implementation of their H&S programs.

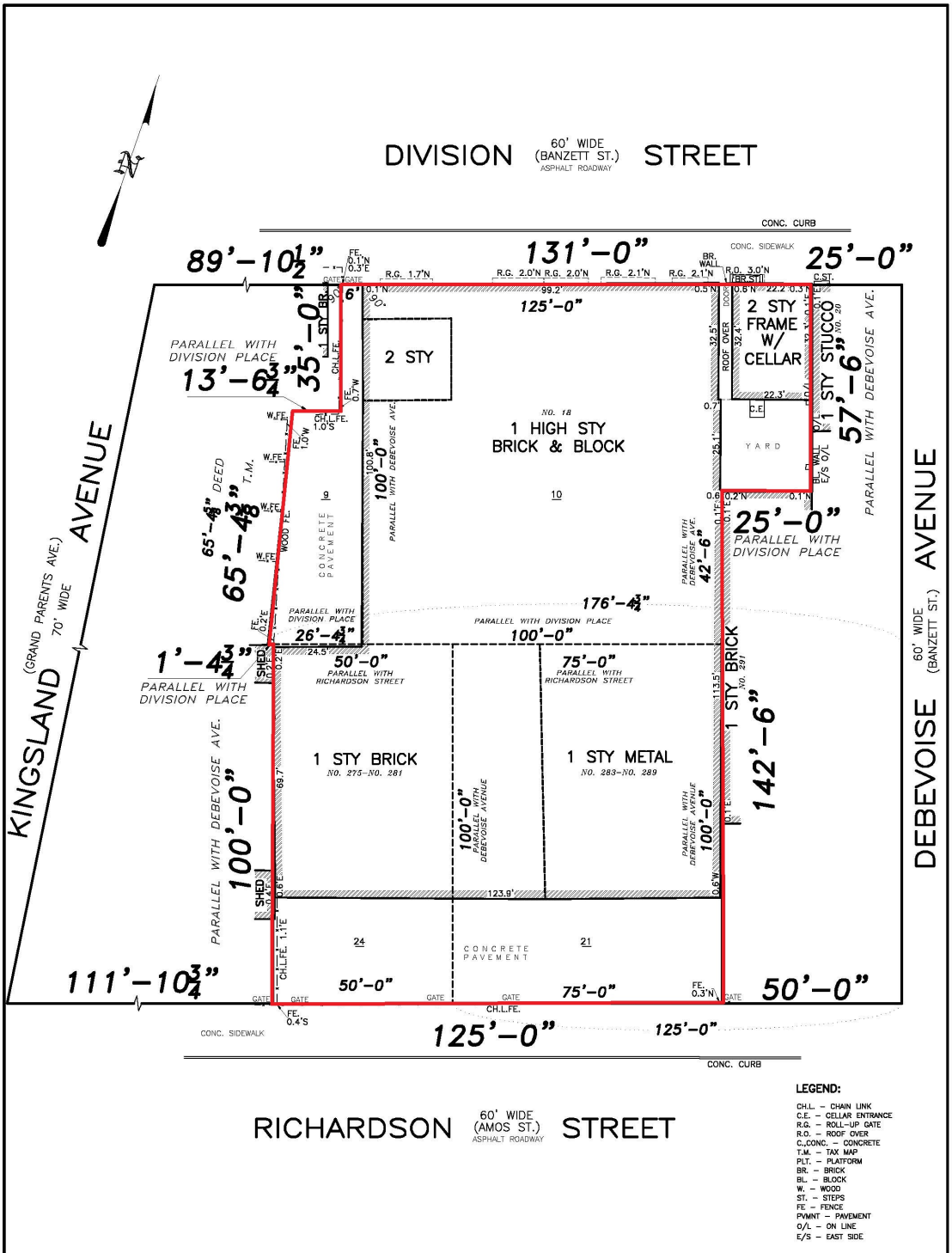
References

1. DER-10 Technical Guidance for Site Investigation and Remediation, dated May 2010 (DER-10
2. NYCRR Part 375-6.5, Commercial Soil Cleanup Objectives (SCOs) and Protection of Groundwater SCOs
3. Sampling for 1,4-Dioxane (dioxane) and polyfluoroalkyl substances (PFAS) will be performed under DECs Part 375 Remedial Programs, dated June 2021.
4. Site Characterization, Phase IX, Work Assignment D7622-27, Meeker Avenue Plume Trackdown, December 2016. C224121
5. Former Goodman Brothers Steel Drum Company, Data Summary Report, Work Assignment D007622-41, Section 5.2-Recommendations, dated January 2020" (Goodman Report, 2020. C224211
6. Former Goodman Brothers Steel Drum Company, Data Summary Report, Work Assignment D007622-41, dated January 2020. Site C224211
7. Goodman Brothers Steel Drum Upland Site Summary (DUSS), Anchor QEA, Dated May 2012.
8. NYSDEC Order on Consent, Dated September 23, 1987
9. NYDEC Order on Consent, Dated June 18, 2003.
10. New York State Department of Health, Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006, Updated May 2017
11. NYSDOH Guidance on Air Emissions of VOCs at DER Remediation Sites

.

Figures

Figure 1
SITE MAP



LEGEND:

CH.L. – CHAIN LINK
C.E. – CELLAR ENTRANCE
R.G. – ROLL-UP GATE
R.O. – ROOF OVER
C.,CONC. – CONCRETE
T.M. – TAX MAP
PLT. – PLATFORM
BR. – BRICK
BL. – BLOCK
W. – WOOD
ST. – STEPS
FE – FENCE
PVMNT – PAVEMENT
O/L – ON LINE
E/S – EAST SIDE

TITLE SURVEY	
SCALE 1" = 25'	JOB NO. NYL20152
DATE 02-27-2020	

Certification indicated hereon signify that this survey was prepared in accordance with the existing Code of Practice for Land Surveys adopted by the New York State Association of Professional Land Surveyors. Said certifications shall run only to the person for whom the survey is prepared, and on his behalf to the title company, governmental agency and lending institution listed hereon, and to the assignees of the lending institution.
Certifications are not transferable to additional institutions or subsequent owner. Unauthorized alteration or addition to a survey map bearing a licensed land surveyor's seal is a violation of section 7209, sub-division 2, of the New York State Education Law.
Only copies from the original of this survey marked with an original of the land surveyor's embossed seal shall be considered to be valid true copies.

EASEMENTS NOT SHOWN ARE NOT GUARANTEED.
THIS SURVEY IS TO BE USED FOR TITLE PURPOSES ONLY.

MALGORZATA GASIOROWSKA N.Y.S. L.L.S. 051047

NY LAND TECH P.C.
LAND SURVEYING
office 516-783-0856
email info@nyland-tech.com
449 Argyle Road, East Meadow NY 11554

THE OFFSETS OR DIMENSIONS SHOWN HEREON, FROM THE PROPERTY LINES TO THE STRUCTURES ARE FOR A SPECIFIC PURPOSE AND USE, THEREFORE THEY ARE NOT INTENDED TO MONUMENT PROPERTY LINES OR TO GUIDE THE ERECTION OF FENCES, ADDITIONAL STRUCTURES OR ANY OTHER IMPROVEMENTS.

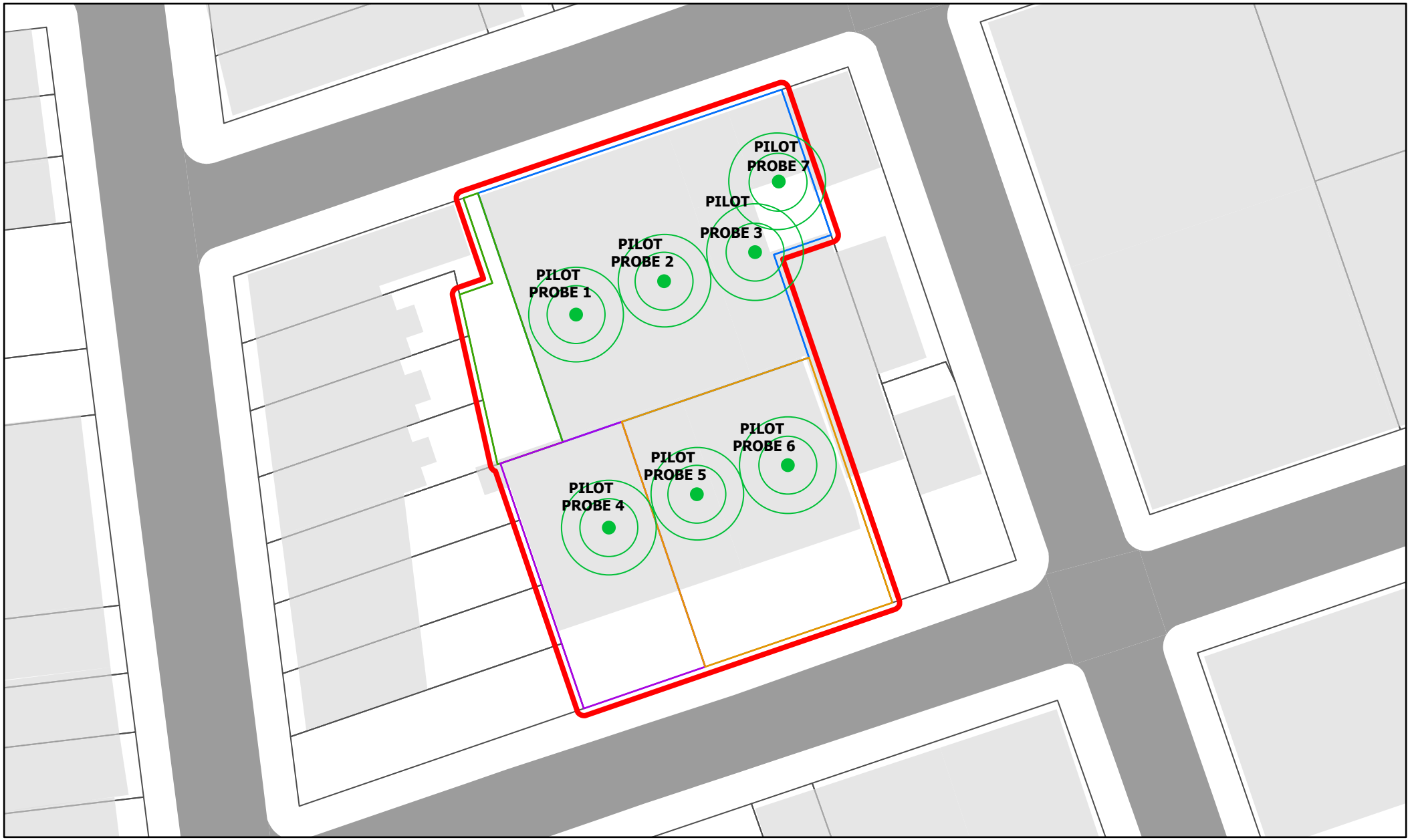
REVISIONS:

ADDRESS:
#14-#18 DIVISION PLACE,
#275-#289 RICHARDSON STREET,
BROOKLYN, KINGS CO., NEW YORK

CERTIFIED TO:

TITLE NO.:

TAX MAP	SEC. –	BLOCK 2849	LOT(S) 9, 10, 21, 24	FILED MAP –	BLOCK –	LOT(S) –



Legend

- Former Goodman Brothers
- 14-18 Division Place
- Vacant Land
- 275 Richardson Street
- 289 Richardson Street
- Pilot Probe Locations

0 25 50 100 US Feet

N

Figure 2
Pilot Study Probe Locations
18 Division Place IRM

18 Division Place
Brooklyn, New York

equity environmental engineering
500 International Drive, Suite 150, Mount Olive, NJ 07828
Office: (973) 527-7451 / Fax: (973) 858-0280

DRAWN BY / DATE	REV / DATE	DRAWING NUMBER
MG/6.29.22		2022020-02

Appendix A

Community Air Monitoring Plan (CAMP)

Community Air Monitoring Program
18 Division Place, Brooklyn, NY
224211

This site specific Community Air Monitoring Program (CAMP) was prepared in general conformance with the New York State Department of Health (NYSDOH) Generic CAMP and is intended to mitigate potential exposures to known volatile organic compounds at the Site. Exposure pathways will be generated from invasive investigative work proposed as part of the Remedial Investigation Work Plan (RIWP). DPC proposes to establish site specific action exceedance values prior to the start of work with NYSDOH, in accordance with "Special Requirements for Work within 20 feet of Potentially Exposed Individuals or Populations or Structures and Special Requirements for Indoor Work with Co Located Residences and Facilities".

Real-time air monitoring for volatile organic compounds (VOCs) and particulate levels at the perimeter of the exclusion zone or work area will be performed. Continuous monitoring will be performed for all ground intrusive activities and during the handling of contaminated or potentially contaminated media. Ground intrusive activities include, but are not limited to soil/groundwater sampling and handling.

A portable photoionization detector (PID) will be used to monitor the work zone and for periodic monitoring for VOCs during activities such as soil and groundwater sampling. Periodic monitoring for VOCs will be performed during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection, for instance, will consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a reading prior to leaving a sample location. Depending upon the proximity of potentially exposed individuals, continuous monitoring may be performed during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, or adjacent to a residence. Exceedances of action levels observed during performance of the Community Air Monitoring Plan (CAMP) will be reported to the DEC Project Manager and NYSDOH within 24 hours and included in the Daily Report. DPC will collect background readings prior to the start of each work day, which will be shared with NYSDEC and NYSDOH as a component of the Daily Field Reports. These background and upwind readings will establish exceedance action levels.

VOC Monitoring, Response Levels, and Actions

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

If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities will resume with continued monitoring.

If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities 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 exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown.

All 15-minute readings must be recorded and be available for NYSDEC & NYCDOH personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

If the downwind PM-10 particulate level is 100 micrograms per cubic meter (ug/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.

If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work will be stopped and a re-evaluation of activities initiated. Work will resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative pressure enclosures, or special ventilation devices should be considered to prevent exposure related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 ug/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 ug/m3 or less at the monitoring point.

All readings will be recorded, included in progress reports, and made available for NYSDEC & NYSDOH personnel to review.

Major Emissions

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.

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

Mitigation & Suppression Techniques

Preventative measures for dust generation may include covering soils with tarps.

Work practices to minimize odors and vapors include limiting the time that the boreholes remain open, and minimizing the handling of contaminated material. Offending odor and organic vapor controls may include the application of foam suppressants, including Rusmar odor-control foam (RusFoam® OC AC645 or approved equivalent) or placing polyethylene sheeting or non-odorous soil over the odor or VOC source areas for short-term control of the odor and VOCs.

If odors develop and cannot otherwise be controlled, additional means to eliminate odor nuisances will include: use of chemical odorants in spray or misting systems; and, use of staff to monitor odors in surrounding neighborhoods.

Where odor nuisances have developed during remedial work and cannot be corrected using the discussed vapor suppression techniques, or where the release of nuisance odors cannot otherwise be avoided due to on-site conditions or close proximity to sensitive receptors, odor control may be achieved by sheltering handling areas under tented containment structures equipped with appropriate air venting/filtering systems. If vapors and odors are generated that cannot be controlled, the need for containment structures will be discussed with the NYSDEC and NYSDOH.

Monitoring of Nearby Structures
This section applies where structures within about 20 feet of the intrusive work may be occupied during the planned remedial action. Where this condition exists, the following will be considered for incorporation into the CAMP:

1. One of the CAMP monitoring stations will be placed between the remedial work area and nearest outside wall of the occupied structure. If site conditions warrant, a third station may be used to accomplish this task.
2. If 15-minute-average total VOC concentrations exceed 1 ppm above background near the outside wall or next to intake vents of the occupied structure, periodic VOC monitoring will be performed within the occupied structure.
3. If 15-minute-average total PM10 concentrations exceed 150 µg/m3 above background near the outside wall or next to intake vents of the occupied structure, work activities will be temporarily suspended until suppression techniques are implemented and

concentrations return to background.

4. Where nuisances have developed during remedial work and cannot be corrected using the techniques described above, use of additional engineering controls may be considered, such as vapor/dust barriers or ventilation devices.
5. Consideration should be given to scheduling or sequencing ground-intrusive activities during periods when potentially exposed populations may not be occupying the structure.

Reporting

A summary of CAMP findings, including triggered action levels, will be provided daily to the NYSDEC and NYSDOH project managers as part of daily reporting. In addition to a summary of CAMP findings, daily reports will include:

1. An update of progress made during the reporting day;
2. Locations of work and quantities of material imported and exported from the site;
3. Locations of CAMP monitoring stations, soil stockpiles, and decontamination stations;
4. References to map for site activities;
5. A summary of any and all complaints with relevant details (names, phone numbers);
6. An explanation of notable site conditions;
7. Actions anticipated for the next reporting day; and
8. Site photographs from the day's remedial activities.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC or the NYSDOH of emergencies (accident, spill), requests for changes to the CAMP or the IRMWP, or other sensitive or time critical information; however, such conditions will also be included in the daily reports. Emergency conditions and changes to the CAMP or the IRMWP will be addressed directly to the NYSDEC and NYSDOH project managers via personal communication. If site conditions warrant, the remedial engineer may request to change from daily to weekly reports that include the above information.