Site Management Plan

Mount Vernon Former Manufactured Gas Plant Site

Westchester County, New York

NYSDEC Site Number: V00569

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Prepared for:

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Prepared by:

AECOM

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Revisions to Final Approved Site Management Plan:

Revision #	Submitted Date	Summary of Revision	DEC Approval Date

CERTIFICATION PAGE

I, Thomas P Clark, certify that I am currently a NYS registered professional engineer (#085258) and that this Site Management Plan was prepared in accordance with all applicable statues and regulations and in substantial conformance with the New York State Department of Environmental Conservation (NYSDEC) Technical Guidance for Site Investigation and Remediation (DER-10).

Signature _____ Date: 9/16/14

EXECUTIVE SUMMARY

The ***Site Management Plan (SMP)*** document is required as an element of the remedial program at the Mount Vernon Former Manufactured Gas Plant Site (hereinafter referred to as the "Site") under the New York State ("NYS") Voluntary Cleanup Program ("VCP") administered by the New York State Department of Environmental Conservation ("NYSDEC"). The Site was investigated and remediated in accordance with Voluntary Cleanup Agreement Index # D2-0003-02-08 (the "VCA"), Site # V00569.

Consolidated Edison Company of New York, Inc. ("Con Edison") entered into the VCA with the NYSDEC to implement a NYSDEC-approved remedial program for the contamination caused by the manufactured gas plant ("MGP") that Con Edison's predecessor companies formerly operated at the Site, an approximately 1.95-acre area comprised of five parcels of real property located in the southwestern section of the City of Mount Vernon, Westchester County, New York. The five parcels comprising the Site and the seven off-Site parcels that were remediated under the VCA are listed below. Their locations and boundaries are provided in **Figure ES-1** of this Executive Summary.

Site and Off-Site Properties

Site or Off-Site	Street Address	Tax Map Block/Lot	Current Use	Current Owner
Site	103 West 5th Street, 342, 346, & 350 South 8th Avenue,	Block 3057/ part of Lot 5	Residential Apartment Buildings	Greater Centennial Homes Housing Development Funds Corp. (HDFC)
Site	106 West 5th Street, 403 & 407 South 9th Avenue,	Block 3058/ part of Lot 1	Residential Apartment Buildings	Greater Centennial Homes HDFC
Site	359 South 9th Avenue	Block 3057/Lot 15	Residential Apartment Building	359 South 9th Avenue LLC
Site	351 South 9th Avenue	Block 3057/Lot 16	Vacant Residentially-Zoned Land	Con Edison
Site	349 South 9th Avenue	Block 3057/Lot 17	Vacant Residentially-Zoned Land	Con Edison
Off-Site	347 South 9th Avenue	Block 3057/Lot 18	Vacant Residentially-Zoned Land	Con Edison
Off-Site	345 South 9th Avenue	Block 3057/Lot 30	Vacant Residentially-Zoned Land	Con Edison
Off-Site	341 South 9th Avenue	Block 3057/Lot 19	One Family House	Melvin and Joan Lee
Off-Site	102 West 5th Street	Block 3058/ part of Lot 1	Residential Apartments	Greater Centennial Homes HDFC
Off-Site	69 West 5th Street	Block 3064/ part of Lot 26	Residential Apartments	Greater Centennial Homes HDFC
Off-Site	401 South 8th Avenue	Block 3063/ Lot 1	Convenience Store	Mount Zion Christian Baptist Church
Off-Site	411 South 8th Avenue	Block 3063/ Lot 41	Church	Mount Zion Christian Baptist Church

After completion of the remedial measures that were required by the NYSDEC, residual MGP-related contamination was left in place (referred to as "Remaining Contamination") at varying depths beneath portions of three on-Site parcels and four off-Site parcels. These seven parcels where Remaining Contamination is present in the subsurface and to which the SMP applies are listed below and are referred to collectively as ***"Controlled Properties."*** The locations and boundaries of the ***Controlled Properties*** are shown on **Figure ES-1** of this Executive Summary.

Controlled Properties Subject to SMP

Site or Off-Site	Street Address	Tax Map Block/Lot	Deed Restriction	Current Use	Current Owner
Site	103 West 5th Street, 346/350 South 8th Avenue,	Block 3057/ part of Lot 5	Required	Residential Apartments	Greater Centennial Homes HDFC
Site	106 West 5th Street, 403/407 South 9th Avenue,	Block 3058/ part of Lot 1	Required	Residential Apartments	Greater Centennial Homes HDFC
Site	359 South 9th Avenue	Block 3057/Lot 15	Required	Residential Apartments	359 South 9th Avenue LLC
Off-Site	102 West 5th Street	Block 3058/ part of Lot 1	Not Required	Residential Apartments	Greater Centennial Homes HDFC
Off-Site	69 West 5th Street	Block 3064/ part of Lot 26	Not Required	Residential Apartments	Greater Centennial Homes HDFC
Off-Site	401 South 8th Street	Block 3063/ Lot 1	Not Required	Convenience Store	Mount Zion Christian Baptist Church
Off-Site	411 South 8th Street	Block 3063/ Lot 41	Not Required	Church	Mount Zion Christian Baptist Church

Engineering Controls ("ECs") and ***Institutional Controls ("ICs")*** have been incorporated into the NYSDEC-approved remedial program for the Site in order to control potential exposure to Remaining Contamination during the use of the ***Controlled Properties*** and thus ensure protection of public health and the environment. In general, the ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. Accordingly, the SMP for the Mt. Vernon Site specifies the methods necessary to ensure compliance with all site-specific ECs and ICs required as part of the NYSDEC-approved remediation program to manage Remaining Contamination on the ***Controlled Properties.***

The three ***on-site Controlled Properties*** and the four ***off-Site Controlled Properties*** are subject to this SMP and require compliance with all ECs and ICs imposed on those ***Controlled Properties*** as part of the NYSDEC-approved Site remedy. In addition, the three ***on-Site Controlled Properties*** require Deed Restrictions approved by the NYSDEC, and recorded with the Westchester County Clerk.

The SMP includes four plans:

1. Engineering and Institutional Control Plan for the implementation and management of EC/ICs;
2. Site Inspection and Monitoring Plan for the implementation and reporting of routine inspections of the Controlled Properties;
3. Operation and Maintenance Plan for the implementation of ECs at the site (i.e., isolation cap, SSDS, and oxygen injection); and
4. Site Management Reporting Plan for the submittal of annual Periodic Review Reports ("PRRs") to the NYSDEC for the Controlled Properties and the periodic submittal of data, information, recommendations, and certifications to the NYSDEC for the Controlled Properties.

Con Edison, as the Remedial Party under the VCA, retains overall responsibility for the proper implementation of each of these four plans.

Roles and Responsibilities

The roles and responsibilities of Property Owners (of the Controlled Properties) and Con Edison (as the Remedial Party) are described in detail in the SMP. For ease of use by the Property Owners and their representatives, the key requirements for the respective parties are outlined below. It is noted that, although the roles are summarized here, both the Property Owners and Con Edison are required to comply with all the relevant provisions specified in the SMP document. All parties must understand and acknowledge that the SMP is the prevailing document regarding the future management of the controlled properties relative to the ICs and ECs.

Property Owner Responsibilities:

The Property Owner is responsible to ensure compliance with pertinent provisions of the SMP and associated plans. In brief, this entails:

1) Notifying NYSDEC and/or Con Edison in advance of any plans for the Controlled Properties that will entail intrusive work (e.g., digging of soil deeper than 2 feet), change of property use, selling or transfer of ownership.
2) If excavating clean fill from an isolation cap area(s) this shall be stockpiled and re-used as backfill when the shallow excavation (i.e., less than 2 feet deep) is complete. The exception to this is the use of routine topsoil for back fill of such shallow excavations/intrusive work (i.e., less than 2 feet deep).
3) Providing written certification to Con Edison annually that the Institutional Controls (ICs), such as Deed Restriction, remain in force.
4) Providing written certification to Con Edison annually that the Engineering Controls (ECs), which include isolation cap, sub-slab depressurization system (SSDS) and or oxygen injection system, have not been modified, disabled, removed and or otherwise compromised.

Con Edison Responsibilities:

Con Edison (as the Remedial Party) is responsible to ensure proper implementation of the SMP and associated plans. In brief, this entails:

1) Responding to notifications/inquiries received from the Property Owner and or NYSDEC (on behalf of the Owners of the ***Controlled Properties***) regarding planned intrusive work, change of property use, planned sale or transfer of ownership, etc. of the ***Controlled Properties***.
2) Operating, inspecting and maintaining all Engineering Controls (ECs), including: isolation cap, sub-slab depressurization system (SSDS) and oxygen injection system to ensure that these systems are operating and have not been modified, removed or compromised.
3) Providing an Annual Review Report documenting and summarizing all inspections and maintenance activities, documenting all monitoring measurements/data, and certifying that the ICs remain in force and ECs continue to operate as designed.

It is important to note that the SMP details the site-specific implementation procedures that are required as part of the NYSDEC-approved remedial program for the Mt. Vernon former Manufactured Gas Plant Site. Failure to properly implement this SMP is a violation of the VCA, which are grounds for the NYSDEC's revocation of the Release and Limited Covenant Not to Sue that the NYSDEC issued to Con Edison for the Site under the VCA.

LEGEND

- BUILDING
- FENCE
- DEED RESTRICTION AREA AND SITE MANAGEMENT PLAN APPLIES
- SITE MANAGEMENT PLAN ONLY AREAS

} THESE AREAS ENCOMPASS THE **CONTROLLED PROPERTIES**

- C — **CONTROLLED BUILDING**

AREAS WHERE SUBSURFACE ACTIVITIES ARE SUBJECT TO THE EXCAVATION WORK PLAN

- EXCAVATIONS > 3 FT BGS. REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS > 15 FT BGS. REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS > 18 FT BGS REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS BELOW CONTROLED BULDINGS
- EXCAVATIONS BELOW 2 FT BGS IN AREAS WITHOUT ISOLATION CAP OR NOT COVERED BY CONTROLLED BUILDING.
- EXCAVATIONS BELOW GROUNDWATER TABLE (APPROXIMATELY 12FT. BGS)
- EXCAVATIONS OF SOIL BELOW 10 FT BGS AT IN-PLACE TREATMENT AREA.

FT BGS – FEET BELOW GROUND SURFACE

30’ 0 60’

GRAPHIC SCALE 1”=60’

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**INSTITUTIONAL CONTROLS AND AREAS SUBJECT TO THE EXCAVATION WORK PLAN**
DATE: 09/15/14	DRWN: RCW		**FIGURE ES-1**

File: T:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-C-05.dwg Layout: ES-1 Institutional Controls User: bourdeauj Plotted: Sep 15, 2014 - 6:24pm Xref's:

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ASP	Analytical Services Protocol
AWQSGV	Ambient Water Quality Standards and Guidelines Values
bgs	below ground surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylene
CAMP	Community Air Monitoring Plan
CCS	Composite Cover System
COC	Certificate of Completion
COIs	Constituents of Interest
DNAPL	Dense Non Aqueous Phase Liquid
DER-10	NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation
DO	Dissolved Oxygen
DUSR	Data Usability Summary Report
EC	Engineering Controls
ECL	Environmental Conservation Law
EDR	Environmental Data Resources
ELAP	Environmental Laboratory Approval Program
EWP	Excavation Work Plan
FER	Final Engineering Report
ft	feet
GCH	Greater Centennial Homes
GSVS	Groundwater Sump Vent System
HASP	Health and Safety Plan
IC	Institutional Controls
MGP	Manufactured Gas Plant
MNA	Monitored Natural Attenuation
NAD-83	North American Datum of 1983
NAVD 88	North American Vertical Datum of 1988
NYCRR	New York Codes Rules and Regulations
NYC	New York City
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OCAS	Order on Consent Index and Administrative Settlement
OLM	Oil-Like Material

ORP	Oxidation Reduction Potential
PAHs	Polycyclic Aromatic Hydrocarbons
PE	Professional Engineer
PRR	Periodic Review Report
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QEP	Qualified Environmental Professional
RAO	Remedial Action Objective
RASR	Remedial Action Selection Report
RI	Remedial Investigation
ROW	Right of Way
SC	Site Characterization
SCG	Standards, Criteria, and Guidance
SCO	Soil Cleanup Objectives
SMP	Site Management Plan
SSDS	Sub-Slab Depressurization System
SUNY	State University of New York
SVI	Soil Vapor Intrusion
SVOCs	Semi Volatile Organic Compounds
TLM	Tar-Like Material
USEPA	United Stated Environmental Protection Agency
USGS	United States Geological Society
VOCs	Volatile Organic Compounds
VCA	Voluntary Cleanup Agreement
VCP	Voluntary Cleanup Program

1.0 INTRODUCTION AND DESCRIPTION OF REMEDIAL PROGRAM

1.1 INTRODUCTION

This document is required as an element of the remedial program at the Mount Vernon Former Manufactured Gas Plant Site (hereinafter referred to as the "Site") under the New York State ("NYS") Voluntary Cleanup Program ("VCP") administered by the New York State Department of Environmental Conservation ("NYSDEC"). The Site was investigated and remediated in accordance with Voluntary Cleanup Agreement Index # D2-0003-02-08 (the "VCA"), Site # V00569, which was executed on August 15, 2002, and modified on August 25, 2005, September 10, 2007, and July 16, 2010.

1.1.1 General

Consolidated Edison Company of New York, Inc. ("Con Edison") entered into the VCA with the NYSDEC to implement a NYSDEC-approved remedial program for the contamination caused by the manufactured gas plant ("MGP") that Con Edison's predecessor companies formerly operated at the Site, an approximately 1.95-acre area comprised of five parcels of real property located in the southwestern section of the City of Mount Vernon, Westchester County, New York. The VCA requires Con Edison to remediate MGP-contaminated media on the five parcels comprising the Site and on seven neighboring parcels where MGP-related contamination was either discovered during the NYSDEC-approved investigation conducted for the Site under the VCA, or is likely to be present based upon the results of that investigation. The five parcels comprising the Site and the seven off-Site parcels that were remediated under the VCA are listed below. Their locations and boundaries are provided in **Figures 1-1 and 1-2** of this Site Management Plan ("SMP").

Site and Off-Site Properties

Site or Off-Site	Street Address	Tax Map Block/Lot	Current Use	Current Owner
Site	103 West 5th Street, 342, 346, & 350 South 8th Avenue,	Block 3057/ part of Lot 5	Residential Apartment Buildings	Greater Centennial Homes Housing Development Fund Corp. (HDFC)
Site	106 West 5th Street, 403 & 407 South 9th Avenue,	Block 3058/ part of Lot 1	Residential Apartment Buildings	Greater Centennial Homes HDFC
Site	359 South 9th Avenue	Block 3057/Lot 15	Residential Apartment Building	359 South 9th Avenue LLC
Site	351 South 9th Avenue	Block 3057/Lot 16	Vacant Residentially-Zoned Land	Con Edison
Site	349 South 9th Avenue	Block 3057/Lot 17	Vacant Residentially-Zoned Land	Con Edison
Off-Site	347 South 9th Avenue	Block 3057/Lot 18	Vacant Residentially-Zoned Land	Con Edison
Off-Site	345 South 9th Avenue	Block 3057/Lot 30	Vacant Residentially-Zoned Land	Con Edison
Off-Site	341 South 9th Avenue	Block 3057/Lot 19	One Family House	Melvin and Joan Lee
Off-Site	102 West 5th Street	Block 3058/ part of Lot 1	Residential Apartments	Greater Centennial Homes HDFC
Off-Site	69 West 5th Street	Block 3064/ part of Lot 26	Residential Apartments	Greater Centennial Homes HDFC
Off-Site	401 South 8th Avenue	Block 3063/ Lot 1	Convenience Store	Mount Zion Christian Baptist Church
Off-Site	411 South 8th Avenue	Block 3063/ Lot 41	Church	Mount Zion Christian Baptist Church

After the completion of the remedial measures specified in the NYSDEC Decision Document and NYSDEC-approved Remedial Action Selection Report ("RASR") discussed below in **Section 1.4**, MGP-related

contamination was left in place at varying depths beneath portions of the three Site parcels and four off-Site parcels identified below and shown on **Figure 1-3** of this SMP. The MGP-related contamination left in place in the subsurface of those Site and off-Site parcels is hereinafter referred to as "**Remaining Contamination**." The Site and off-Site parcels where Remaining Contamination is present in the subsurface and to which this SMP applies are hereinafter referred to collectively as "**Controlled Properties.**" The locations and boundaries of the Controlled Properties are shown in **Figure 1-2** of this SMP. Metes and boundaries surveys and descriptions of the Controlled Properties are presented in **Appendix A** of this SMP.

This SMP was prepared to manage the Remaining Contamination on the Controlled Properties in perpetuity or until the earlier to occur of: (a) the extinguishment of the Declarations of Covenants and Restrictions ("Deed Restrictions") for the three Controlled Properties listed below for which Deed Restrictions are required by the NYSDEC-approved remedial program for the Site; and (b) the NYSDEC issues a written determination that compliance with this SMP is no longer necessary to protect human health and/or the environment for the four off-Site Controlled Properties listed below for which Deed Restrictions are not required by the NYSDEC-approved Site remedial program. All reports associated with the Site and Controlled Properties can be viewed by contacting the NYSDEC or its successor agency managing environmental issues in New York State.

Controlled Properties Subject to SMP

Site or Off-Site	Street Address	Tax Map Block/Lot	Deed Restriction	Current Use	Current Owner
Site	103 West 5th Street, 346/350 South 8th Avenue,	Block 3057/ part of Lot 5	Required	Residential Apartments	Greater Centennial Homes HDFC
Site	106 West 5th Street, 403/407 South 9th Avenue,	Block 3058/ part of Lot 1	Required	Residential Apartments	Greater Centennial Homes HDFC
Site	359 South 9th Avenue	Block 3057/Lot 15	Required	Residential Apartments	359 South 9th Avenue LLC
Off-Site	102 West 5th Street	Block 3058/ part of Lot 1	Not Required	Residential Apartments	Greater Centennial Homes HDFC
Off-Site	69 West 5th Street	Block 3064/ part of Lot 26	Not Required	Residential Apartments	Greater Centennial Homes HDFC
Off-Site	401 South 8th Street	Block 3063/ Lot 1	Not Required	Convenience Store	Mount Zion Christian Baptist Church
Off-Site	411 South 8th Street	Block 3063/ Lot 41	Not Required	Church	Mount Zion Christian Baptist Church

1.1.2 Purpose

The Controlled Properties contain Remaining Contamination left in place in the subsurface after the completion of the NYSDEC-approved remedial program implemented by Con Edison for the Site pursuant to the VCA. Engineering Controls ("ECs") and Institutional Controls ("ICs") have been incorporated into the NYSDEC-approved Site remedial program to control exposure to Remaining Contamination during the use of the Controlled Properties to ensure protection of public health and the environment. For the three Controlled Properties that comprise portions of the Site and that are subject to this SMP, Deed Restrictions approved by the NYSDEC, and recorded with the Westchester County Clerk, require compliance with this SMP and all ECs and ICs imposed on those Controlled Properties as part of the NYSDEC-approved Site remedy. The four ***off-Site*** Controlled Properties that are subject to this SMP and for which ***Deed Restrictions are not required*** by the NYSDEC-approved Site remedy, compliance with this SMP and the ECs and ICs applicable to those Controlled Properties is required.

The ICs place restrictions on site use, and mandate operation, maintenance, monitoring and reporting measures for all ECs and ICs. This SMP specifies the methods necessary to ensure compliance with all

ECs and ICs required as part of the NYSDEC-approved Site remedial program for contamination that remains on the Controlled Properties. This SMP has been approved by the NYSDEC, and compliance with this SMP is required by Con Edison and all current and future owners of the Controlled Properties. The roles and responsibilities of the owners of the Controlled Properties and Con Edison, as the Remedial Party under the VCA, are described in **Appendix B** of this SMP. Con Edison is responsible for reimbursing certain reasonable costs incurred by the property owner in the course of complying with this SMP.

This SMP provides a detailed description of all procedures required to manage Remaining Contamination on the Controlled Properties, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; (3) operation and maintenance of all treatment, collection, containment, or recovery systems; (4) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports; and (5) defining criteria for termination of treatment system operations.

To address these needs, this SMP includes four plans: (1) an Engineering and Institutional Control Plan for the implementation and management of EC/ICs; (2) a Site Inspection and Monitoring Plan for the implementation and reporting of routine inspections of the Controlled Properties; (3) an Operation and Maintenance Plan for the implementation of remedial collection, containment, treatment, and recovery systems (including, where appropriate, preparation of an Operation and Maintenance Manual for complex systems); and (4) a Site Management Reporting Plan for the submittal of annual Periodic Review Reports ("PRRs") to the NYSDEC for the Controlled Properties and the periodic submittal of data, information, recommendations, and certifications to the NYSDEC for the Controlled Properties. Con Edison as the Remedial Party under the VCA is responsible for the proper implementation of each of these four plans.

It is important to note that this SMP details the site-specific implementation procedures that are required as part of the NYSDEC-approved remedial program for the Site. Failure to properly implement this SMP is a violation of the VCA, which is grounds for the NYSDEC's revocation of the Release and Limited Covenant Not to Sue that the NYSDEC issued to Con Edison for the Site under the VCA.

1.1.3 Revisions

This SMP may only be revised with the approval of the NYSDEC. Revisions to this plan will be proposed in writing to the NYSDEC's project manager. In accordance with the VCA and Deed Restrictions for the Controlled Properties, the NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files. Per the provisions of this SMP, Con Edison will notify the owners of the Controlled Properties of all SMP revisions approved by the NYSDEC and will provide each such owner with a copy of the NYSDEC-approved revisions to the SMP.

1.2 SITE BACKGROUND

1.2.1 Site Location and Description

The Site is located between South 8th and South 9th Avenues along both sides of West 5th Street in a predominately residential area within the southwestern section of the City of Mount Vernon, Westchester County, New York. The coordinates for the Site are approximately N 40°54′7.6″ latitude and W 73°50′16.5″ longitude. The Site is composed of five parcels of real property, covering a total land area of approximately 1.95 acres, located on portions of two Mount Vernon Tax Map blocks (Blocks 3057 and 3058). The off-Site properties that are subject to this SMP are located on portions of four Mount Vernon Tax Map blocks (Blocks 3057, 3058, 3063 and 3064). No former MGP facility structures are present above the ground surface on the Site or off-Site properties today. All subsurface MGP structures identified during the NYSDEC-approved Site Characterization Study ("SCS") or Remedial Investigation ("RI") that were completed for the Site under the VCA, and observed in excavations, were removed as part of the NYSDEC-approved Site remedial program.

The approximate limits of the former MGP that Con Edison's predecessor companies operated on the Site are shown on **Figure 1-2** of this SMP and encompassed the following five Site parcels:

- Block 3057, central/southern sections of Lot 5 – which was the former location of the MGP's gas production equipment and a 30,000 cubic foot gas holder, and which is currently occupied by the portions of the Greater Centennial Homes ("GCH") apartment building complex known as 103 West 5th Street, 342 South 8th Avenue, 346 South 8th Avenue and 350 South 8th Avenue;
- Block 3058, northeastern section of Lot 1 – which was the former location of the MGP's above ground gas distribution holder and which is currently occupied by the portions of the Greater Centennial Homes apartment building complex known as 106 West 5th Street, 403 South 9th Avenue and 407 South 9th Avenue;
- Block 3057, Lot 15 – which was the former location of the MGP's purifier house and subsurface coal tar/ammonia structure and which is currently occupied by an apartment building (Vernon Arms Apartments) with a street address of 359 South 9th Avenue;
- Block 3057, Lot 16 – which was the former location of a portion of the MGP's coal tar/ammonia well and which is currently vacant residentially-zoned land with a street address of 351 South 9th Avenue; and
- Block 3057, Lot 17 – which was the former location of a portion of MGP's coal tar/ammonia well and which is currently vacant residentially-zoned land with a street address of 349 South 9th Avenue.

1.2.2 Site History

A detailed operational history of the MGP that Con Edison's predecessor companies formerly operated on the Site is presented in the report entitled**, *MGP Historical Investigation Report-Mount Vernon, New York*** (RETEC, 2002). This report was prepared based on information derived from various historical records and reference works, including annual reports of the New York State Public Service Commission*, **Brown's Directory of American Gas Companies** ("**Brown's Directory")*** annual report*s*, Sanborn fire insurance maps and other historical maps, aerial photographs and recorded deeds.

The earliest record of the Mount Vernon MGP appears in the ***1868 Atlas of New York and Vicinity*** (Beers, 1868), which shows buildings and facilities associated with the Mount Vernon MGP located along the northern side of West 5th Street between South 8th and South 9th Avenues in 1868 (now designated as Block 3057 on the Mount Vernon Tax Map). According to ***Brown's Directory*** and Con Edison records, coal gas was produced at the Mount Vernon MGP by the Eastchester Gas Company (a Con Edison predecessor) until approximately 1893, when the Mount Vernon MGP was converted to carbureted gas production (1893 ***Brown's Directory***). Sanborn Maps indicate that the Mount Vernon MGP was expanded sometime between 1887 and 1892 to include a 190,000 cubic foot gas holder on the property located along the southeastern corner of the intersection of West 5th Street and South 9th Avenue (now designated as Block 3058). Gas production stopped sometime between 1900, the last year production information was reported specifically for the Mount Vernon MGP in ***Brown's Directory***, and 1911, the year that the property along the north side of West 5th Street with gas production facilities was sold by the Westchester Lighting Company, the successor to the Eastchester Gas Company and Con Edison's predecessor company.

The parcel along the south side of West 5th Street, which contained the 190,000 cubic foot gas holder, was not sold until 1927. According to Sanborn Maps, this holder was no longer used by 1918. Aerial photographs indicate that some of the MGP structures located on the parcel along the north side of West 5th Street remained until at least 1925, long after the parcel had been sold by the Westchester Lighting Company. **Figure 1-2** of this SMP shows the parcels where the MGP facilities were located.

Following the removal of gas manufacturing operations, one- and two-family homes were constructed on the portions of the Site designated as Block 3057, Lots 16 and 17 on the Mount Vernon Tax Map. In 1963, a five-story apartment building (Vernon Arms Apartments) was constructed on the portion of the Site designated as Block 3057, Lot 15. In 1972, Greater Centennial Homes Housing Development Fund Corporation ("GCH") began constructing two/three-story apartment buildings and associated off-street parking lots on the remaining portions of the Site.

1.2.3 Geologic Conditions

The Site is located in the New England Upland physiographic province, which encompasses most of Westchester County. This physiographic province is characterized by a thin surficial layer of glacial till and stream deposited (fluvial) sediments overlying shallow metamorphic and igneous bedrock.

Geology at the Site consists of fluvial sediments, comprised of six unconsolidated units varying in thickness and distribution, over till and bedrock across the Site. These units are shown on geologic cross-section E-E' presented on **Figure 1-4** of this SMP**.** Starting at the ground surface, these units consist of fill, mottled silts, silty sands, inter-bedded and sorted fine sands, sand and gravels, and till. The irregular distribution of these units suggests a depositional history involving significant hydraulic reworking by a stream or small river. More recent reworking of the unconsolidated units has occurred locally during development and redevelopment activities at the Site, which involved the excavation and backfilling with both native soils and soils from off-Site sources. This reworking includes the recent remedial excavation and backfilling activities discussed below in **Section 1.3** and shown on **Figure 1-5** of this SMP.

Bedrock at the Site is encountered at depths between 9 and 35 feet below ground surface ("bgs"). The bedrock has an uneven surface across the Site. In general, the top of bedrock is shallow to the northwest, west, and south, with deeper areas along West 5th Street and to the east and northeast. The upper one to two feet of bedrock is typically weathered to a low permeability saprolitic or clay-like material. The bedrock is a silvery black, foliated, mica-schist with foliations aligned at or near vertical.

1.2.3.1 Surface Water Flow

The land surface at the Site slopes from the north-northwest across the Site to the southeast. The highest elevation in the northwest portion of the Site is 127 feet above mean sea level ("MSL") and the lowest elevation in the southeast is approximately 119 feet above MSL, thus there is a net decrease in elevation across the study area of eight feet. There are no surface water bodies or discharge areas to surface water on the Site. Based on local topography, surface water would be expected to flow southeast across the Site; however, the majority of runoff from the Site is captured by local storm drains. The nearest surface water body is the Hutchinson River, which is located approximately 4,500 feet to the southeast of the Site. The Site is not located within a designated Federal Emergency Management Agency ("FEMA") flood zone. The nearest flood zone is the area immediately surrounding the Hutchinson River.

1.2.3.2 Groundwater Flow

Regional groundwater flow mimics the land surface topography, which slopes from the northwest to the southeast. It is likely that groundwater in the region of Westchester County, where the Site is located, ultimately discharges to the Hutchinson River to the southeast of the Site. There is no known significant unconsolidated aquifer at or in the vicinity of the Site. Groundwater in the vicinity of the Site is classified by NYSDEC as Class GA – fresh groundwater with best usage as a source of potable water supply. This area is not classified as a Primary Water Supply Aquifer (*i.e.*, not a significant unconsolidated aquifer) or a Principal Aquifer (NYSDEC 1990). Municipal water is supplied to this area, and groundwater is not used as a resource at or in the vicinity of the Site.

As part of the NYSDEC-approved SCS and RI conducted for the Site under the VCA, twenty monitoring wells screened across the water table were installed to obtain information regarding the hydrogeology and groundwater quality at the Site. Groundwater occurs at depths ranging from approximately 6.5 to 12 feet bgs in the unconsolidated overburden soils, which consist of the fill, glacial till and fluvial sediments. As shown on **Figure 1-6** of this SMP, the generalized groundwater flow direction based on the June 6, 2005 measurements, is from the northwest and west to the southeast, which is consistent with the presumed regional groundwater flow direction based on local topography. Aside from the till deposits found at the top of bedrock, no significant confining units were observed in the soil borings.

1.3 SUMMARY OF REMEDIAL INVESTIGATION FINDINGS

An NYSDEC-approved SCS and RI for the Site were conducted by Con Edison between 2003 and 2005 pursuant to the VCA. The results of the SCS and RI are discussed in detail in the report entitled ***Remedial Investigation Report – Mount Vernon Works Former Manufactured Gas Plant Site, Mount Vernon, New York***, dated May 2006 (RETEC, 2006) that Con Edison filed with the NYSDEC for the Site. These investigations were conducted on both the Site properties and off-Site properties identified above in **Section 1.1.1** of this SMP.

1.3.1 Surface Soil

Surface soils across the Site and off-Site parcels (soils extending from ground surface to a depth of two feet bgs) are comprised of non-native fill. The surface soils in the study areas of the SCS and RI contained an abundance of anthropogenic materials, such as ash from burning of wood and coal, ash, brick and concrete rubble and other debris, as well as deposition of airborne particles of dust, soot, etc.

1.3.2 Subsurface Soil

MGP impacts were detected in subsurface soil above and below the water table on portions of the Site and off-Site parcels. These areas of higher impacts, areas that contained subsurface soils with concentrations of semi-volatile organic compounds ("SVOCs") greater than 500 mg/kg or volatile organic compounds ("VOCs") greater than 10 mg/kg, or that contained oil-like material ("OLM") or tar-like material ("TLM"), were generally associated with historic MGP structures on the Site parcels located on Block 3057 (hereinafter the "Northern Parcel"), including the remnants of the foundations of the MGP's 30,000 cubic foot gas holder, coal tar and ammonia structure, and ammonia/tar well. The majority of surface soil and subsurface soil impacts were removed during the implementation of the remedial action specified as part of the NYSDEC-approved Site remedy. **Figure 1-7** of this SMP shows areas where MGP-related impacts were detected prior to the remediation, and **Figure 1-3** of this SMP shows the areas of the former site where MGP impacts are known or assumed to remain in subsurface soils (the Controlled Properties subject to this SMP) within areas excavated.

1.3.3 Groundwater

Figure 1-8 of this SMP shows the extent of groundwater impacts for total VOCs, and total SVOCs on all Site and off-Site parcels. As the figure shows, concentrations of VOCs and SVOCs were located around the former MGP structures on the Northern Parcel where extensive amounts of subsurface TLM were identified below the water table during the NYSDEC-approved SCS and RI. Groundwater contamination from the source area on Block 3057 has migrated onto portions of Block 3063, Lots 1 and 41, at 401 and 411 South 8th Avenue (collectively referred to as the "Southeast Corner Parcels"). These parcels are owned by Mount Zion Christian Baptist Church.

The relatively short distance that the contaminants of interest ("COIs") in groundwater have migrated away from the area of high concentration subsurface MGP source material on the Northern Parcel and the low concentrations of COIs in groundwater relative to the concentrations of COIs in the subsurface MGP-source material show that the migration of these constituents is being strongly attenuated by natural conditions in the water table aquifer. During the approximately 100 years since the former MGP ceased operations, the dissolved VOCs and SVOCs in groundwater have only migrated approximately 150 feet from the areas of subsurface MGP-source material on the Northern Parcel. Based upon measured groundwater flow rates on and nearby to the Site, groundwater migrates at approximately 70 feet per year. Using this flow rate, groundwater and the dissolved COIs in the groundwater beneath the Northern Parcel would have migrated more than a mile from the time the MGP ceased operations to the present time. Therefore, it is concluded that even before the implementation of the remedial actions specified in the NYSDEC-approved Site remedy, the COIs in groundwater have been and are continuing to be significantly attenuated. In addition to the excavation of impacted soil and the injection of in-situ oxygen release compound as part of the remedial actions completed for the Site, MGP impacts to groundwater are also being addressed through the operation of an oxygen injection system. This SMP includes groundwater monitoring activities that will be performed to evaluate the affect of these remedies on groundwater quality.

1.3.4 Indoor Air and Soil Gas

Soil gas and indoor air samples were obtained from all buildings on the Site and all potentially affected buildings located off-Site. VOCs associated with MGP residues were detected at low to moderate concentrations in most soil gas samples. However, in only four of the corresponding indoor air samples, concentrations of these VOCs were detected above the 90th percentile of typical background concentrations listed in NYSDOH's ***Background Indoor/Outdoor Air Levels of Volatile Organic Compounds in Homes Heated with Fuel Oil Sampled by the New York State Department of Health***, 1997-2003 (NYSDOH 2004). Comparisons of soil gas to indoor air results indicated that indoor air was not being adversely impacted by the subsurface conditions (RETEC 2006).

Analytical results for an indoor air sample collected from a basement room that contains a groundwater sump at the Mount Zion Church building located at 411 South 8th Avenue showed that the concentration of only one VOC (ethylbenzene) was detected above the NYSDOH 90th percentile value for typical indoor air background. The source of this VOC was linked to the groundwater in the sump. Laboratory analysis for VOCs of three additional samples from the church basement did not show any exceedances of the 90th percentile of published background concentrations.

1.3.5 MGP Structures

The following subsurface MGP structures were identified during the Site SCS and RI. As discussed below in **Section 1.4** of this SMP, these structures were excavated and removed as part of the remedial actions completed for the Site.

- Tar/Ammonia Well – This structure was located in the backyard areas of the former one and two-family homes at 349 South 9th Avenue and 351 South 9th Avenue. The structure contained TLM. The foundation walls of the structure appeared to be intact.
- Tar and Ammonia Structure – This structure was located beneath a portion of the parking lot of the Vernon Arms apartment building at 359 South 9th Avenue. No impacts associated with this structure were observed to be present beneath or adjacent to the Vernon Arms apartment building.
- Northern Gas Holder Foundation – This structure was intact beneath the paved GCH parking lot located next to the 346/350 South 8th Avenue GCH apartment buildings. The structure contained TLM and the subsurface soils surrounding the gas holder foundation were found to be impacted to varying degrees with TLM. Mobile dense non-aqueous phase liquids ("DNAPL") had been identified in a monitoring well immediately west of the holder foundation.
- Gas Works – Retort, Condenser, Generator Room, Scrubber – The building that contained the gas production equipment was historically located beneath and immediately west of the GCH apartment building at 346/350 South 8th Avenue. Only small remnants of the foundation for the gas works building were found. Some impacted soil was found beneath the grassy area behind and to the west of the apartment building.

1.4 SUMMARY OF REMEDIAL ACTIONS

The Site and off-Site parcels were remediated in accordance with the remedy selected by the NYSDEC for the Site in its VCP Decision Document dated May 2008 and the following reports and plans prepared by Con Edison for the Site under the VCA: (1) NYSDEC-approved Remedial Action Selection Report ("RASR") dated May 2007; and (2) NYSDEC-approved Remedial Design Drawings and Specifications dated October 2012. The factors considered during the selection of the Site remedy are those listed in the NYSDEC's regulations in 6 NYCRR 375-1.8. Specific details of the remedial actions completed at the Site are summarized in the Final Engineering Report (AECOM, 2013) for the Site. The following is a summary of the Remedial Actions performed at the Site.

1.4.1 GCH Properties and Vernon Arms Property

Remedial action activities completed on the GCH and Vernon Arms properties include the following:

- Excavation of the coal tar-contaminated subsurface foundations of the former MGP's northern gas holder, coal tar and ammonia structure, and coal tar/ammonia well from the areas on Block 3057 depicted in **Figure 1-5** of this SMP;
- Excavation of approximately 680 cubic yards of exposed surface soils affected by past MGP operations from the areas on Blocks 3057 and 3058 depicted on **Figure 1-5** of this SMP;
- Excavation of approximately 17,600 cubic yards of subsurface soil containing elevated concentrations of MGP-related VOCs, SVOCs, and polycyclic aromatic hydrocarbons and/or TLM from the areas on Block 3057 depicted on **Figure 1-5** of this SMP;
- Application of oxygen release compounds to the remaining soils at the bottoms of the subsurface soil excavations on Block 3057;
- Construction and maintenance, in the areas where surface and/or subsurface soils were excavated, of a composite soil cover system consisting of a visible demarcation barrier overlain by certified clean backfill to prevent human exposure to the subsurface Remaining Contamination left in place under the NYSDEC-approved Site remedy;
- Performance of in-situ chemical oxidation within the areas of Blocks 3057, 3064, and South 8th Avenue shown on **Figure 1-9** of this SMP to chemically degrade residual TLM and dissolved COIs in soil and groundwater;
- Installation and operation of an oxygen injection system on Block 3063 to enhance naturally occurring bioremediation of TLM-related dissolved COIs in groundwater.
- Installation of sub-slab depressurization systems (SSDSs) beneath the GCH apartment buildings located at 346/350 South 8th Avenue and 103 West 5th Street to address potential soil vapor intrusion into those buildings;
- Installation of a groundwater sump vent system (GSVS) in the basement sump of the church at 411 South 8th Avenue to address odors and vapors that may accumulate in the sump.
- Implementation of monitored natural attenuation ("MNA") to document the naturally-occurring bioremediation of dissolved COIs in groundwater to address the NYSDEC-approved Remedial Action Objective ("RAO") for the Site of restoring the aquifer on and around the Site;
- Execution and recording of Deed Restrictions for the GCH and Vernon Arms properties as institutional controls to restrict land use and potential exposure to Remaining Contamination. The Deed Restrictions include the following requirements:
  - Restricting groundwater use;
  - Prohibiting changes in the properties use for purposes other than commercial, industrial, or "restricted residential" without NYSDEC approval;
  - Restricting excavation of subsurface soil containing Remaining Contamination; and
  - Evaluating the need to address soil vapor intrusion for new buildings.
- Development and implementation of this Site Management Plan for long term management of Remaining Contamination as required by the Deed Restrictions, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting. Specific issues addressed by the SMP include operation and maintenance of the sub-slab depressurization system, groundwater sump venting system, and oxygen injection system and post-remediation groundwater monitoring.
- Periodic inspection and certification of the institutional and engineering controls described above.

1.4.2 Residential Properties and 341 South 9th Avenue

The NYSDEC-approved remedial action implemented for the residential properties located at 351 South 9th Avenue, 349 South 9th Avenue, 347 South 9th Avenue and 345 South 9th Avenue (the "Residential Properties") and for the southern half of the one-family residential property located at 341 South 9th Avenue was excavation of all surface and subsurface soils containing VOCs, SVOCs and PAHs at concentrations that exceeded the NYSDEC's soil cleanup objectives ("SCOs") for "unrestricted use." Prior to and as a preliminary phase of the planned unrestricted use cleanup of the Residential Properties, Con Edison purchased and demolished the one and two-family houses on these four parcels (Block 3057, Lots 16, 17, 18 and 30) to allow access to contaminated soils beneath those structures. Demolition of structures was not required for 341 South 9th Avenue because the MGP-related contamination located on this off-Site property (Block 3057, Lot 19) was limited to the landscaped side yard area comprising the southern half of the property. Because all soils containing VOCs or PAHs at concentrations above the NYSDEC's unrestricted-use SCOs were removed from the Residential Properties and 341 South 9th Avenue property, the NYSDEC-approved remedial program for the Site does not include engineering controls and/or institutional controls (such as land use restrictions) to protect public health and the environment. These properties are not subject to this SMP.

1.4.3 South 8th Avenue

The remedial activities implemented for the section of South 8th Avenue located adjacent to the Northern Parcel include the following:

- In Situ Chemical Oxidation to address the RAO for the treatment of TLM-related dissolved COIs in the Site's groundwater and restoration of the groundwater aquifer.
- Implementation of MNA to document the naturally-occurring bioremediation of TLM-related dissolved COIs in groundwater to address the RAO for restoration of the aquifer on and around the Site.

1.4.4 Southeast Corner Properties

The remedial activities implemented for the Southeast Corner Properties located at 401 and 411 South 8th Avenue (Block 3063, Lots 1 and 17) included the following:

- Installation and operation of an oxygen injection system to enhance the rate of naturally-occurring bioremediation of the TLM-related dissolved COIs in the groundwater migrating to the Southeast Corner Properties from the Northern Parcel; to prevent the additional migration of such COIs in groundwater to the Southeast Corner Properties; and to address the RAO for restoration of the groundwater aquifer on and around the Site;
- Continued use of the air-tight cover system that was installed over the groundwater sump located in the northern-half of the basement of the church building located on the 411 South 8th Avenue property and continued operation of the electric exhaust fan system installed to vent vapor accumulating in the sump to the outside the church building;
- Restriction on the use of groundwater from beneath the Southeast Corner Properties;
- Restriction on the excavation of subsurface soils containing Remaining Contamination;
- Development and implementation of a Site Management Plan for long term management of Remaining Contamination as required by the NYSDEC-approved Site remedial program, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting. Specific issues addressed by the SMP include operation and maintenance of the sub-slab depressurization system and oxygen injection system and post-remediation groundwater monitoring.
- Periodic inspection and certification of the institutional and engineering controls described above.

2.0 ENGINEERING AND INSTITUTIONAL CONTROL PLAN

2.1 INTRODUCTION

2.1.1 General

Since remaining contaminated soil and groundwater exist beneath the Controlled Properties, Engineering Controls and Institutional Controls ("EC/ICs") are required to protect human health and the environment. This Engineering and Institutional Control Plan describes the procedures for the implementation and management of all EC/ICs for the Controlled Properties. The EC/IC Plan is one component of the SMP and is subject to revision by NYSDEC.

2.1.2 Purpose

This plan provides:

- A description of all EC/ICs on the Controlled Properties.
- The basic implementation and intended role of each EC/IC.
- A description of the key components of the ICs made enforceable by the Deed Restrictions (**Appendix C** of this SMP – Declarations of Convents and Restrictions) for the Controlled Properties.
- A description of the features to be evaluated during each required inspection and periodic review.
- A description of plans and procedures to be followed for implementation of EC/ICs, such as the implementation of the Excavation Work Plan (**Appendix D** of this SMP) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Controlled Properties.
- Any other provisions necessary to identify or establish methods for implementing the EC/ICs required by the Site remedy, as determined by the NYSDEC.

2.2 ENGINEERING CONTROLS

2.2.1 Engineering Control Systems

Engineering controls included in the NYSDEC-approved Remedial Action for the Site include composite cover systems ("CCSs") for subsurface soils containing Remaining Contamination, sub-slab depressurization systems ("SSDSs") for GCH apartment buildings 103 West 5th Street and 346/350 South 8th Avenue, , and an air tight cover and the Groundwater Sump Vent System ("GSVS") located in the basement of the church building at 411 South 8th Avenue and an oxygen injection system located on 401 South 8th Avenue. **Figures 2-1**, **2-2 and 2-3** of this SMP shows the locations of these engineering controls.

2.2.1.1 Composite Cover System

Exposure to Remaining Contamination in subsurface soil/fill is prevented by the CCSs placed over portions of the Controlled Properties on Blocks 3057 and 3058; **Figure 2-1** of this SMP shows the location, materials of construction and thickness of each such cover system. These CCSs are comprised of a minimum of 36 inches of clean soil/backfill over a demarcation boundary layer. The Excavation Work Plan that appears in **Appendix D** of this SMP outlines the procedures required to be implemented in the event any CCS is breached, penetrated or temporarily removed, and/or any underlying Remaining Contamination is disturbed. Procedures for the inspection and maintenance of CCSs are provided in included in **Section 3.2** of this SMP.

2.2.1.2 Sub-Slab Depressurization Systems/Groundwater Sump Vent System

SSDSs have been installed in the GCH apartment buildings located at 103 West 5th Street and 346/350 South 8th Avenue. Although odors and elevated concentrations of volatile MGP-related vapors were not detected in these GCH buildings during the SCS, RI, or remedial action, the SSDSs were installed in them as a precaution against potential future vapor intrusion. A vent system was also installed for the groundwater sump in the basement of the church building located on the Mount Zion property at 411 South 8th Avenue. System locations are shown on **Figure 2-2** of this SMP.

The SSDS installed in each of the above GCH apartment buildings consists of a single suction point installed through the basement slab in the building's boiler room. Piping was installed from the suction point, through the exterior wall of the boiler room to a blower installed on the side of the building. From the blower, the system was piped through a stack on the roof of the building.

The purpose of the GSVS installed in the basement of the Mount Zion Church building is to address odors and vapors that may accumulate in the groundwater sump. The church is located hydraulically downgradient from the Site and groundwater migrating from the Site to the Southeast Corner Properties presently contains elevated concentrations of dissolved VOCs and SVOCs. The system consists of an air tight cover over the groundwater sump in the church's basement coupled with suction piping in the sump connected to a blower. The suction piping from the sump runs through the wall of the basement wall of the building to a blower mounted on the outside of the building. From the blower, a stack pipe runs up the side of the building to a vent above the building's roof.

Procedures for operating and maintaining the SSDSs for the GCH apartment buildings and the GSVS for the Mount Zion Church building are documented in the Operation and Maintenance Plan (**Section 4**) of this SMP. Procedures for monitoring these systems are included in the Monitoring Plan (**Section 3**) of this SMP. The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect the required engineering controls for the Controlled Properties, occurs.

2.2.1.3 Oxygen Injection System

Ten oxygen injection wells were installed in the sidewalk area of the southeast corner properties along the southeast corner of South 8th Avenue and West 5th Street. These properties are hydraulically downgradient from the Site and groundwater containing elevated concentrations of VOCs and SVOCs presently migrates from the Site onto the northern portion of the Southeast Corner Properties. The oxygen injection system layout is shown on **Figure 2-3** of this SMP. The oxygen injection wells were installed in a linear array designed to intersect the leading edge of the groundwater plume. The remaining components of the delivery system consist of oxygen tanks, a distribution manifold, regulators, and pressure and flow gauges, which are connected to the injection wells via buried tubing. The oxygen tanks, distribution manifold, regulators, and pressure and flow gauges are housed in a metal enclosure located on the Mount Zion 401 South 8th Avenue property.

Procedures for operating and maintaining the oxygen injection system are documented in the Operation and Maintenance Plan (**Section 4**) of this SMP. Procedures for monitoring the system are included in the Monitoring Plan (**Section 3**) of this SMP. The Monitoring Plan also addresses severe condition inspections in the event that a severe condition, which may affect the required engineering controls for the Controlled Properties, occurs.

2.2.2 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the Decision Document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10.

2.2.2.1 Composite Cover System

The CCSs present on portions of the Controlled Properties are permanent controls and the quality and integrity of these systems will be inspected at defined, regular intervals in perpetuity. The CCSs may not be impaired or removed without the express written consent of the NYSDEC, which the NYSDEC may condition on, among other things, the implementation of additional NYSDEC-approved remedial measures

to address the Remaining Contamination present beneath the section of the Controlled Properties for which consent to alter or remove the CCS is granted by the NYSDEC.

2.2.2.2 Sub-Slab Depressurization Systems and Groundwater Sump Vent System

The SSDSs for GCH apartment buildings 103 West 5th Street and 346/350 South 8th Avenue and the GSVS for the Mount Zion Church Building at 411 South 8th Avenue, will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the SSDSs or the GSVS is no longer required, a proposal to discontinue the SSDSs or GSVS will be submitted to the NYSDEC and NYSDOH by either: (a) Con Edison with notice to the owner of the Controlled Property for which the system is required; or (b) the owner of the Controlled Property with notice to Con Edison.

2.2.2.3 Oxygen Injection System

The oxygen injection system installed along the sidewalk area of the property at 401 South 8th Avenue will not be discontinued unless prior written approval is granted by the NYSDEC. In the event that monitoring data indicates that the oxygen injection system is no longer required, a proposal to discontinue the system will be submitted to the NYSDEC by either the owner of that property with notice to Con Edison, or by Con Edison with notice to the property owner. Conditions that warrant discontinuing the oxygen injection system include contaminant concentrations in groundwater that: (1) reach levels that are consistently below ambient water quality standards; (2) have become asymptotic to a low level over an extended period of time as accepted by the NYSDEC; or (3) the NYSDEC has determined that the system has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the Site. The system will remain in place and operational until permission to discontinue its use is granted in writing by the NYSDEC.

2.3 INSTITUTIONAL CONTROLS

A series of Institutional Controls ("ICs") will be implemented to: (1) maintain and monitor the CCSs on the Controlled Properties; (2) control disturbances of the Remaining Contamination on the Controlled Properties (**Figure 2-1** of this SMP**)**; and, (3) limit use of the Controlled Properties to Commercial Use, Industrial Use or Restricted Residential Use. Adherence to these ICs for the Controlled Properties is required by the Deed Restrictions (**Appendix C** of this SMP – Declaration of Covenants and Restrictions) for the Site properties and the off-Site properties subject to this SMP. **Figure 2-4** of this SMP shows the locations where ICs will be implemented.

The Site-specific ICs are:

- Compliance with the relevant provisions of the Deed Restrictions and this SMP by the Grantor and the Grantor's successors and assigns, including the Grantor's successors-in-title to the Site.
- Maintenance and operation by the Remedial Party of all ECs specified in this SMP.
- Inspection of all ECs and certification of the continued integrity of the ECs by Con Edison at a frequency and in a manner defined in this SMP.
- Reporting of data and information pertinent to Site Management at the frequency and in a manner defined in this SMP.

ICs identified in the Deed Restrictions and/or this SMP may not be discontinued without: (a) an amendment to or extinguishment of the Deed Restriction consented to by the NYSDEC for the Controlled Properties for which Deed Restrictions are required under the NYSDEC-approved Site remedial program; or (b) issuance of written consent by the NYSDEC to the discontinuation of the ICs for the Controlled Properties for which Deed Restrictions are not required under the NYSDEC-approved Site remedial program. The Controlled Properties have a series of ICs in the form of property use restrictions. Adherence to these ICs is required by the Deed Restrictions for those Controlled Properties for which Deed Restrictions are required as part of the NYSDEC-approved Site remedial program. The property use restrictions that apply to the Controlled Properties are as follows:

- The Controlled Properties may be used only for Commercial, Industrial, or Restricted Residential Use provided that the long-term ECs/ICs included in this SMP are employed.
- The Controlled Properties may not be used for a higher level of use, such as Residential Use or Unrestricted Use, without consideration of additional remediation and the amendment of the Deed Restrictions, as approved by the NYSDEC.
- All future activities on the Controlled Properties that disturb Remaining Contamination must be conducted in accordance with this SMP.
- Use of the untreated groundwater underlying the Controlled Properties is prohibited without the approval of the NYSDEC.
- The potential for soil vapor intrusion must be evaluated for any buildings developed in the shaded areas noted on **Figure 1-3** of this SMP, and any potential vapor intrusion impacts that are identified in that area must be monitored or mitigated, as specified by the NYSDEC and NYSDOH.
- Vegetable gardens and farming are prohibited on the Controlled Properties.
- Con Edison will submit to NYSDEC a written statement that certifies, under penalty of perjury, that: (1) the controls employed for the Controlled Properties are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC; and, (2) nothing has occurred that impairs the ability of the controls to protect public health and environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access the Site at any time in order to evaluate the continued maintenance of any and all controls. The inspection shall be conducted annually and the certification submitted for each annual inspection or an alternate period of time that NYSDEC may allow and will be made by an expert that the NYSDEC finds acceptable.

2.3.1 Excavation Work Plan

The Controlled Properties have been remediated for Restricted Residential Use. Any future intrusive work that will penetrate the CCS, or that will encounter or disturb the Remaining Contamination on the Controlled Properties, including any modifications or repairs to the existing CCS, will be performed in compliance with the Excavation Work Plan ("EWP") that is attached as **Appendix D** to this SMP. Areas where remaining MGP contamination is known to be present and the depths below ground surface are shown on **Figure 2-1** of this SMP. In addition, compliance with the EWP is also required for: (1) excavation of subsurface soils beneath buildings on the sections of Block 3057, Lots 5 and 15 and Block 3058/Lot 1 for which the excavation/removal of MGP-contaminated soil was not completed as part of the NYSDEC-approved Site remedy; and (2) excavation of subsurface on the sections of Block 3057, Lots 5 and 15 and Block 3058/Lot 1 at depths of two feet bgs or more where soil impacts have not been previously identified; and (3) excavation of subsurface soils below the water table on Block 3063/Lots 1 and 41. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in a Health and Safety Plan ("HASP") and Community Air Monitoring Plan ("CAMP") prepared for the Controlled Properties. **Appendix E** of this SMP includes a HASP template that is in current compliance with DER-10, and 29 CFR 1910, 29 CFR 1926, and all other applicable Federal, New York State and local regulations and the an outline of the NYSDOH CAMP Program. Based on future changes to New York State and federal health and safety requirements, and specific methods employed by future contractors, the HASP and CAMP will be updated and re-submitted with the notification provided in **Section D-1** of the EWP. Any intrusive work will be performed in compliance with the EWP, HASP and CAMP, and will be included in the periodic inspection and certification reports submitted under the Site Management Reporting Plan (See **Section 5** of this SMP).

For the purpose of the EWP, intrusive work includes:

- Excavation beneath the specified depth of the visible demarcation barrier of the CCS present on the portions of the Controlled Properties shown on **Figure 2-4** of this SMP;

- Excavation beneath the foundation slabs of the existing buildings on the portions of the Controlled Properties shown on **Figure 2-4** of this SMP;
- Excavation beneath the water table on the Southeast Corner Properties located at 401 and 411 South 8th Avenue; and
- Excavation at depths of two feet or more bgs on those portions of the Controlled Properties, other than the Southeast Properties located at 401 and 411 South 8th Avenue, for which no CCS was installed as part of the implemented remedial action for the Site.

Any party that performs excavation work, the owners of the Controlled Properties, Con Edison within the limits of this SMP, and the associated parties preparing excavation related documents submitted to the State for the Controlled Properties, are completely responsible for the safe performance of all intrusive work, the structural integrity of all excavations, and the structural integrity of all structures that may be affected by the excavations (such as the building foundations). For excavation work conducted by the owner or its contractors on the Controlled Properties, The owners will ensure that following the completion of excavation activities, the CCS described in this SMP is returned to pre-excavation conditions on completion of the work.

2.3.2 Soil Vapor Intrusion Evaluation

Prior to the construction of any new enclosed structures located over areas that contain remaining VOC-contaminated soil or groundwater, a soil vapor intrusion ("SVI") evaluation will be performed by Con Edison in cooperation with the NYSDEC and NYSDOH to determine whether any mitigation measures are necessary to eliminate potential exposure to soil vapors in the proposed structure. Alternatively, an SVI mitigation system may be installed as an element of the building foundation without first conducting an investigation. Such a system would include a vapor barrier and a passive sub-slab depressurization system that is capable of being converted to an active system.

Prior to conducting an SVI investigation or installing a mitigation system, a work plan will be developed and submitted to the NYSDEC and NYSDOH for approval. This work plan will be developed in accordance with the most recent NYSDOH "Guidance for Evaluating Vapor Intrusion in the State of New York". Measures to be employed to mitigate potential vapor intrusion will be evaluated, selected, designed, installed, and maintained based on the SVI evaluation, the NYSDOH guidance, and construction details of the proposed structure.

Preliminary (unvalidated) SVI sampling data will be forwarded to the NYSDEC and NYSDOH for initial review and interpretation. Upon validation, the final data will be transmitted to the agencies, along with a recommendation for follow-up action, such as mitigation.

SVI sampling results, evaluations and follow-up actions will also be summarized in the next Periodic Review Report.

2.4 INSPECTIONS AND NOTIFICATIONS

2.4.1 Inspections

A comprehensive inspection of the Controlled Properties will be conducted annually. The inspections will determine and document that:

- The ECs and ICs continue to perform as designed.
- The ECs and ICs continue to be protective of human health and the environment.
- The Controlled Properties continue to be operated/managed in compliance with requirements of this SMP and the Deed Restrictions.
- Site records (annual and incident response site inspection forms, oxygen injection system maintenance/ repairs, etc.) are complete and up to date.
- Notifications are being made for any planned changes to the ICs.

Inspections will be conducted in accordance with the procedures set forth in the Monitoring Plan of this SMP (**Section 3**). The reporting requirements are outlined in the Periodic Review Reporting section of this SMP (**Section 5**).

If an emergency, such as a natural disaster or an unforeseen failure of any of the ECs occurs, an inspection of the Site will be conducted by a qualified environmental professional ("QEP") or New York State registered professional engineer ("PE") within five (5) days of Con Edison's becoming aware of the event to verify the effectiveness of the EC/ICs implemented at the Controlled Properties.

2.4.2 Notifications

The following notifications will be submitted by the owner to the NYSDEC and Con Edison, as specified below, as needed for the following reasons:

- 60-day advance notice of any proposed change in the use of the Controlled Properties. This notification is required under the terms of the Deed Restrictions, 6 NYCRR Part 375 and/or Environmental Conservation Law and will be made to the NYSDEC and to Con Edison by the owner(s) of the Controlled Property or Controlled Properties for which a change in use is proposed .
- 15-day advance notice of any proposed ground-intrusive activities pursuant to the Excavation Work Plan provided herein as **Appendix D** of this SMP. This notification will be made to the NYSDEC and to Con Edison by the owner(s) of the Controlled Property or Controlled Properties for which the ground-intrusive activities are proposed.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, tornado or earthquake that reduces or has the potential to reduce the effectiveness of the ECs in place at the Controlled Properties, with written confirmation within seven (7) days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public. The required verbal notification will be made to the NYSDEC and to Con Edison by owner(s) of the Controlled Property or Controlled Properties affected by the emergency. The required written confirmation will be made to the NYSDEC by Con Edison.
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action shall be submitted to the NYSDEC by Con Edison within 45 days and shall describe and document actions taken to restore the effectiveness of the ECs.

Con Edison will review all planned ground-intrusive activities for the Controlled Properties. As part of this process, Con Edison will review the RI and FER data for the Site to determine the likelihood for residual MGP-impacted soil to be encountered during the planned intrusive work and, if necessary, collect and analyze soil samples from the specific area of the Controlled Properties where ground-intrusive activities are planned. Based on this review and/or sampling results, Con Edison will recommend that no extraordinary measures be taken beyond those typically used for routine intrusive construction activities, or, will prepare an Excavation Work Plan specifically for the planned intrusive actions in accordance with the provisions outlined in **Appendix D** (Excavation Work Plan) of this SMP.

Any change in the ownership of the Controlled Properties and/or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change or planned changed in ownership, the NYSDEC and Con Edison will be notified in writing by the owner of the affected Controlled Property of the proposed change in the Controlled Property's ownership. This will include a certification that the prospective purchaser of the affected Controlled Property has been provided with a copy of the Deed Restriction applicable to the Controlled Property and this SMP.
- Within 15 days after the transfer of all or part of the Controlled Property, the new owner's name, contact representative, and contact information will be confirmed in writing by the new owner.

The foregoing notifications will be submitted to:

Consolidated Edison Company of New York, Inc.

Name: Director of Remediation
Address: 31-01 20th Avenue Building 136
Astoria, New York 11105
Telephone: (718) 204-4145

NYSDEC Project Manager:

Name: Current NYSDEC Project Manager
Address: New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway 11th floor,
Albany, New York 12233-7014
Telephone: (518) 402-9662

2.5 CONTINGENCY PLAN

Emergencies may include injury to personnel, fire or explosion, the release of hazardous substances or petroleum products at the Controlled Properties, or serious weather conditions.

2.5.1 Emergency Telephone Numbers

In the event of any environmentally related situation or unplanned occurrence at the Controlled Properties requiring assistance, the owner(s) of the affected Controlled Property or Properties should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. These emergency contact lists must be maintained in an easily accessible location at the Site.

Table 2-1 Emergency Contact Numbers

Medical, Fire and Police	911
One Call Center:	(800) 272-4480 (3 day notice required for utility mark-out)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362
Electric (Con Edison)	(800) 752-6633
Mount Vernon Hospital	(914) 664-8000
Water and Sewer, City of Mount Vernon	(914) 665-2300
Neil O'Halloran (Con Edison)	(718)-204-4145
Ken Kaiser (Con Edison)	(718) 267-3881
Horace Davis (Con Edison)	(718) 204-4330

* Note: Contact numbers subject to change and should be updated as necessary

2.5.2 Map and Directions to Nearest Health Facility

Site Location:	103 West 5th Street, Mount Vernon, NY
Nearest Hospital Name:	Mount Vernon Hospital
Hospital Location:	12 North Seventh Ave Mount Vernon, NY 10550

Hospital Telephone:	(914) 664-8000
Directions to the Hospital: **(Figure 2-5** of this SMP**)**	Head North on South 8th Avenue toward W 4th Street Take 1st right onto West 4th Street Turn left at 2nd cross street onto South 6th Avenue Continue onto Wilson Place Continue onto West Roosevelt Square Continue onto North 7th Avenue
Total Distance:	0.9 miles
Total Estimated Time:	3 minutes

Figure 2-5 Map Showing Route from the Site to the Hospital

2.5.3 Response Procedures

As appropriate, the fire department and other emergency response groups will be notified immediately by telephone of the emergency. The emergency telephone number list is found at the beginning of this Contingency Plan (**Table 2-1** of this SMP). The list will be posted prominently at the Controlled Properties and made readily available to all personnel at all times.

3.0 SITE INSPECTION AND MONITORING PLAN

3.1 INTRODUCTION

3.1.1 General

This Site Inspection and Monitoring Plan describes the measures to be undertaken by Con Edison for evaluating the performance and effectiveness of the ICs and ECs to reduce or mitigate Remaining Contamination at the Controlled Properties, including all engineering controls for the Controlled Properties and the affected Site media identified below. The ECs for the Controlled Properties include the CCS, SSDSs for the GCH apartment buildings at 103 West 5th Street and 346/350 South 8th Avenue, the oxygen injection system and GSVS for the Southeast Corner Properties. This Site Inspection and Monitoring Plan may only be revised with the approval of NYSDEC.

3.1.2 Purpose and Schedule

This Site Inspection and Monitoring Plan describes the methods to be used for:

- Sampling and analysis of all appropriate environmental media at the Controlled Properties (e.g., groundwater and soil).
- Assessing compliance with applicable NYSDEC standards, criteria and guidance, particularly ambient groundwater standards and Part 375 SCOs for soil.
- Assessing achievement of the remedial performance criteria.
- Evaluating information for the Controlled Properties periodically to confirm that the remedy continues to be effective in protecting public health and the environment.
- Preparing the necessary reports for the various monitoring activities.

To adequately address these issues, this Site Inspection and Monitoring Plan provides information on:

- Sampling locations, protocol, and frequency;
- Information on all designed monitoring systems (e.g., well logs);
- Analytical sampling program requirements;
- Quality Assurance/Quality Control (QA/QC) requirements;
- Inspection and Reporting requirements.
- Inspection and maintenance requirements for monitoring wells.
- Monitoring well decommissioning procedures.
- Annual inspections and certification.

The monitoring programs for the Controlled Properties are summarized in **Table 3-1** of this SMP and outlined in detail in **Sections 3.2 and 3.3** below.

3.2 COMPOSITE COVER SYSTEM INSPECTION / MONITORING

The CCSs on the Controlled Properties will be inspected annually by Con Edison to confirm that the cover systems are intact, remain unchanged and continue to be protective of human health and the environment. The annual inspection will be documented on the Annual Inspection and Certification Checklist provided in **Appendix F** of this SMP. The form provides a checklist to document if there are any changes since the previous years' inspection and that the EC continues to operate as intended. A survey of the affected

section of the CCS will be completed if significant changes in the cover system occur during the year, or if changes are noted in the annual inspection. The survey will be completed by a New York State licensed surveyor and referenced to the North American Vertical Datum of 1988 (NAVD 88) to an accuracy of 0.01 ± ft and referenced to North American Datum (NAD 83).

If an emergency, such as a natural disaster or unforeseen failure of the EC occurs, Con Edison is responsible for having an inspection of the affected Controlled Property or Properties conducted by a qualified environmental professional or licensed professional engineer within five (5) business days of being notified of the event by the owner(s) of the affected Controlled Property or Properties to verify the effectiveness of the composite cover.

3.3 MEDIA MONITORING

3.3.1 Sub-Slab Depressurization System and Groundwater Sump Vent System

Requirements for the operation and maintenance, performance monitoring and data reporting for the SSDSs for the GCH apartment buildings at 103 West 5th Street and 346/350 South 8th Avenue and the GSVS for the church building located on the Mount Zion at 411 South 8th Street are provided in **Section 4** of this SMP.

3.3.2 Oxygen Injection System

Requirements for operation and maintenance, performance monitoring, and data reporting for the oxygen injection system for the Mount Zion property at 401 South 8th Street are outlined in the **Section 4** of this SMP and **Appendix I** of this SMP.

3.3.3 Groundwater Monitoring Program

Groundwater monitoring will be performed on a periodic basis to assess performance of the remedy. Select monitoring wells that were installed during the SCS and RI for the Site will be used to monitor the long-term trends in groundwater contamination and the performance of the oxygen injection system on the Mount Zion property at 401 South 8th Street. **Figure 3-1** of this SMP shows the locations of wells included in the monitoring program. **Table 3-2** of this SMP summarizes the wells to be sampled, well construction details and elevations, and the analytes to be tested. Two groundwater sampling events were completed in order to develop baseline data associated with the system operation. Routine groundwater sampling will be performed semi-annually for the first two years, and then annually thereafter, pending NYSDEC approval.

Deliverables for the groundwater monitoring program are specified below.

3.3.3.1 Sampling Protocol

Groundwater samples will be collected from 12 monitoring wells (MW-2, MW-4, MW-6, MW-7, MW-10, MW-14, MW-15, MW-16, MW-17, MW-18, MW-19, and MW-20). Prior to purging, each well will be gauged for depth to groundwater. Groundwater samples will be collected following EPA's low-stress (purge) groundwater sampling procedures. Each well will be purged with a peristaltic pump and polyethylene tubing at a rate of approximately 200 ml/minute. Field measurements will be collected with a multi-parameter meter and flow-through cell. The following parameters will be monitored, including salinity, pH, specific conductance, dissolved oxygen (DO), oxidation reduction potential (ORP), temperature, and turbidity. Once parameters have stabilized, samples will be collected in laboratory-supplied bottles. Quality assurance and quality control samples to be collected will include one sample duplicate, one matrix spike, and one matrix spike duplicate per event. Samples will be packed in a cooler with ice and trip blank and submitted to an analytical laboratory. Groundwater samples will be analyzed for:

- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) by EPA Method 8260
- Polynuclear Aromatic Hydrocarbon (PAHs) by EPA Method 8270

Purge water will be stored in 55-gallon drums, and stored within a secure area on the Controlled Property where the monitoring well is located pending disposal. Analytical results will be tabulated and provided as part of the annual PRR. All monitoring well sampling activities will be recorded in a field book and a groundwater-sampling log presented in Attachment C of the Oxygen Injection System Operation,

Maintenance and Monitoring (OM&M) plan (**Appendix I** of this SMP) . Other observations (e.g., well integrity, etc.) will be noted on the groundwater-sampling log. The groundwater-sampling log will serve as the inspection form for the groundwater monitoring well network.

3.3.3.2 Monitoring Well Repairs, Replacement And Decommissioning

If biofouling or silt accumulation occurs in the on-Site and/or off-Site monitoring wells, the wells will be physically agitated/surged and redeveloped. Additionally, monitoring wells will be properly decommissioned and replaced (as per the Monitoring Plan) if an event renders the wells unusable. Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent periodic report. Well decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's "Groundwater Monitoring Well Decommissioning Procedures." Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

3.4 SITE-WIDE INSPECTION

Inspections of all Controlled Properties will be performed once a year. During these inspections, an inspection form will be completed (**Appendix F** of this SMP), and submitted to the NYSDEC in the Annual Review Report. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including site usage.
- An evaluation of the condition and continued effectiveness of ECs.
- General site conditions at the time of the inspection.
- The site management activities being conducted including, where appropriate, confirmation sampling and a health and safety inspection.
- Confirm that required records for the Controlled Properties (annual and incident response site inspection forms, CCS maintenance/repairs, etc.) are up to date.

3.5 MONITORING QUALITY ASSURANCE/QUALITY CONTROL

All required sampling and analyses of environmental media for the Controlled Properties, including soil sampling performed for intrusive excavation activities subject to the Excavation Work Plan in **Appendix D** of this SMP. The Main Components of a quality assurance program include:

- QA/QC Objectives for Data Measurement.
- Sampling Program.
  - Sample containers will be properly washed, decontaminated and appropriate preservative will be added (if applicable) prior to their use by the analytical laboratory. Containers with preservative will be tagged as such.
  - Sample holding times will be in accordance with the NYSDEC Analytical Services Protocol ("ASP") requirements.
  - Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected at a frequency of one per twenty field samples (except trip blanks which will be submitted one per cooler with BTEX samples).
- Sample Tracking and Custody;

- Calibration Procedures;
  - All field analytical equipment will be calibrated immediately prior to each day's use. Calibration procedures will conform to manufacturer's standard instructions.
  - The laboratory will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;

3.6 MONITORING REPORTING REQUIREMENTS

Site forms and any other information generated during regular monitoring/inspection events for the Controlled Properties will be kept on site in the Oxygen Injection System shed, and on file with Con Edison. All forms, and other relevant reporting formats used during the monitoring/inspection events, will be (1) subject to approval by NYSDEC and (2) submitted at the time of the Annual PRR, as specified in the Reporting Plan of this SMP.

All monitoring results will be reported to NYSDEC on a periodic basis in the Annual PRR. If required by the NYSDEC, a letter report will also be prepared, subsequent to each sampling event, including any monitoring events performed in response to an observed or reported change in site conditions. Reports will include, at a minimum:

- Date of event.
- Personnel conducting sampling.
- Description of the activities performed.
- Type of samples collected (e.g., groundwater, soil, etc).
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.).
- Sampling results in comparison to appropriate standards/criteria.
- A figure illustrating sample type and sampling locations.
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format).
- Any observations, conclusions, or recommendations.
- A determination as to whether groundwater conditions have changed since the last reporting event.

Data will be reported in hard copy or digital format as determined by NYSDEC. A summary of the monitoring/inspection program deliverables are summarized in **Table 3-1** below.

Table 3-1 Schedule of Routine Monitoring, Inspections, and Reporting

Monitoring Program	Inspection / Monitoring Frequency[1,2]	Reporting Frequency[1]	Activity / Sampling
Composite Cover System	Annually	Annually	Inspection
Sub-Slab Depressurization Systems	Quarterly	Annually	Inspection of all System Components
Groundwater Sump Vent System	Quarterly	Annually	Inspection of all System Components
Oxygen Injection System	Quarterly	Annually	Inspection of all System Components[3]
Groundwater	Semi-Annually For First Two Years, Annually Thereafter	Annually	Sampling Groundwater For BTEX and PAHs Analyses

1.) The frequency of events and reporting will be conducted as specified unless otherwise directed by NYSDEC.

2.) Inspections are required within 5 business days following an emergency, such as a natural disaster or unforeseen failure of the EC occurs (Section 3.2).

3.) Startup monitoring will be more frequent. See the O&M Plan in Appendix I for specifics.

4.0 OPERATION AND MAINTENANCE PLAN

4.1 INTRODUCTION

As indicated previously, four (4) engineering control systems have been implemented at the Controlled Properties: CCSs, SSDSs in GCH Buildings 103 West 5th Street and 346/350 South 8th Avenue, a GSVS in the church basement at 411 South 8th Avenue, and an oxygen injection system at 401 and 411 South 8th Avenue.

The CCSs do not rely on any mechanical systems, such as those of the sub-slab depressurization systems or air sparge/ soil vapor extraction systems to protect public health and the environment. Therefore, the operation and maintenance of CCS components are not included in this SMP.

This Operation and Maintenance Plan does describe the measures necessary to operate, monitor and maintain the mechanical components of the SSDSs, GSVS and oxygen injection systems. This Operation and Maintenance Plan:

- Includes the steps necessary to allow individuals unfamiliar with the Controlled Properties to operate and maintain the systems;
- Includes an operation and maintenance contingency plan; and
- Will be updated periodically to reflect changes in site conditions or the manner in which the systems are operated and maintained.

Information on the non-mechanical Engineering Controls for the Controlled Properties (i.e. soil cover system) is provided in **Section 2** of this SMP (Engineering and Institutional Control Plan). This Operation and Maintenance Plan is not to be used as a stand-alone document, but as an integral component of the SMP.

4.2 ENGINEERING CONTROL SYSTEM OPERATION AND MAINTENANCE

This section provides operation and maintenance information and procedures for the SSDSs, groundwater sump system and oxygen injection system identified above in **Section 4.1**.

4.2.1 SSDS Systems

This section presents requirements for the operation and maintenance, performance monitoring and data reporting for the SSDSs for the GCH apartment buildings at 103 West 5th Street and 346/350 South 8th Street. System operation and monitoring procedures are included in **Appendix H** of this SMP.

4.2.1.1 SSDS Scope

SSDSs were installed in two buildings on the Site, 346/350 South 8th Avenue. and 103 West 5th Street. Operation and Maintenance activities required to maintain system effectiveness were developed based on recommendations from the system installer and are presented in **Appendix H** of this SMP. Activities to be performed include the following:

- Inspections of SSDS piping to verify there are no cracks, breaks, or other damage
- Inspection of the manometer on the suction piping to verify system vacuum is operating correctly
- Repair or replacement of system components if they are damaged or are not operating correctly.

4.2.1.2 SSDS System Restart and Testing

The SSDSs were started up and tested in May of 2012. Startup procedures included the following:

- Turning on the system fan, and

- Measuring the system vacuum in the suction piping.

In the future, the system will only be shut down to repair damage or replace parts. Once that work is complete, the fan will be turned on and the system vacuum as measured by the manometer on the suction pipe for the affected SSDS will be checked.

4.2.1.3 SSDS Operation: Routine Operations Procedures

Under normal conditions, the SSDS will operate indefinitely without any input from the system operator other than the routine inspections described previously.

4.2.1.4 SSDS Operation: Routine Equipment Maintenance

No routine maintenance activities are required. The system will operate indefinitely unless damage or malfunction are identified during routine inspections.

4.2.1.5 SSDS Non-Routine Equipment Maintenance

Non-routine maintenance activities will be required if inspection indicates that components of the system are not operating properly. If problems with system operation are identified, the following sequence will be followed:

- Shut down the system and implement standard lockout/tagout procedures.
- Repair or remove and replace defective components with identical products or with alternatives which comply with the system specifications. Restart the fan and check system negative pressure.
- All maintenance activities will be performed by personnel knowledgeable with operation of the components that comprise the SSDSs.

4.2.2 Groundwater Sump Vent System

This section presents requirements for the operation and maintenance, performance monitoring and data reporting for the GSVS system for the Mount Zion Church located at 411 South 8th Avenue.

4.2.2.1 GSVS Scope

The GSVSwas installed in the basement of the Mount Zion Church located at 411 South 8th Avenue. Operation and Maintenance activities required to maintain system effectiveness were developed based on recommendations from the system equipment manufacturer.

- Inspections of piping to verify there are no cracks, breaks, or other damage.
- Inspection of the system fan and manometer installed in the system piping to verify the system is operating properly.
- Repair or replacement of system components if they are damaged or are not operating.

4.2.2.2 GSVS System Start-up and Testing

Startup procedures for the GSVS system include the following:

- Turning on the system fan, and
- Measuring the system vacuum in the suction piping.

The system testing described above will be conducted if, in the course of the GSVP system lifetime, significant changes are made to the system. In the future, the system will only be shut down to repair damage or replace parts. Once that work is complete, the fan will be turned on and the system vacuum will be checked.

4.2.2.3 GSVS System Operation: Routine Operations Procedures

Under normal conditions, the GSVS system will operate indefinitely without any input from the system operator other than the routine inspections described previously.

4.2.2.4 GSVS System Operation: Routine Equipment Maintenance

No routine maintenance activities are required. The system will operate indefinitely unless damage or malfunction are identified during routine inspections.

4.2.2.5 GSVS System Non-Routine Equipment Maintenance

Non-routine maintenance activities will be required if inspection indicates that components of the system are not operating properly. If problems with system operation are identified, the following sequence will be followed:

- Shut down the system and implement standard lockout/tagout procedures.
- Repair or remove and replace defective components with identical products or with alternatives which comply with the system specifications.
- Restart the fan and check system negative pressure.

All maintenance activities will be performed by personnel knowledgeable with operation of the components that comprise the GSVS.

4.2.3 Oxygen Injection System

Requirements for the operation and maintenance, performance monitoring and data reporting for the oxygen injection system at 401 South 8th Avenue are provided in the operations and maintenance plan in **Appendix I** of this SMP.

4.2.3.1 Oxygen Injection System Operation Scope

Injection wells associated with the Oxygen Injection system were installed in the sidewalks along the front and north side of the store located at the corner of South 8th Avenue and West 5th Street in 2012. Additional system equipment was installed in a stainless steel enclosure and the system was started up in April 2013. Activities required to maintain the system include the following:

- Changing oxygen tanks
- Periodic groundwater monitoring
- Checking system performance parameters including water levels and DO

These procedures are described in detail in the system O&M Plan included in **Appendix I** of this SMP.

4.2.3.2 Oxygen Injection System Operation System Start-up and Testing

Required procedures for oxygen injection system start-up and testing include the following activities:

- iSOC installation
- Equipment start-up
- Balancing oxygen flow
- Oxygen injection system checks

These procedures are described in detail in the system O&M Plan included in **Appendix I** of this SMP.

4.2.3.3 Oxygen Injection System Operation: Routine Operations Procedures

The oxygen injection system is designed to operate between oxygen tank changes without input from the operator. For that reason, no routine operations activities are required.

4.2.3.4 Oxygen Injection System Operation: Routine Equipment Maintenance

The only routine maintenance activity required for the oxygen injection system is replacement of the oxygen tank. This procedure is described in detail in the System O&M Plan included in **Appendix I** of this SMP.

4.2.3.5 Oxygen Injection Non-Routine Equipment Maintenance

Conditions that trigger non-routine equipment maintenance may include but are not limited to:

- Visible damage to the system
- Anomalous pressure readings on one or more oxygen delivery legs which are not due to identified leaks on those legs
- Low DO concentrations in the wells
- Increased rate of oxygen consumption
- Low groundwater levels leading to iSOC emergence and discontinued oxygen delivery to the aquifer.

Non-routine maintenance activities required for the oxygen injection system include the following:

- Checking iSOC units for flooding
- Reinstalling the iSOC units
- Checking the system components in the treatment shed for leaks
- Replacing piping, valves, or tubing, etc..

These procedures are described in detail in the system O&M Plan included in **Appendix I** of this SMP.

4.3 ENGINEERING CONTROL SYSTEM PERFORMANCE MONITORING

4.3.1 SSDS

4.3.1.1 SSDS Monitoring Schedule

The SSDSs for 103 West 5th Street and 346/350 South 8th Avenue will be inspected on a quarterly basis each year.

4.3.1.2 SSDS General Equipment Monitoring

The only equipment monitoring required is checking the negative pressure in the system manometers and inspecting system components during routine inspections

4.3.1.3 SSDS System Monitoring Devices and Alarms

Manometers installed in the system piping in the boiler rooms at 346/350 South 8th Avenue. and 103 West 5th Street are the devices used to monitor system operation.

4.3.1.4 SSDS Sampling Event Protocol

No sampling will be performed related to the SSDSs.

4.3.2 GSVS System

4.3.2.1 GSVS Monitoring Schedule

The GSVS system will be inspected on a quarterly basis each year.

4.3.2.2 GSVS General Equipment Monitoring

During the routine monitoring of the GSVS system, the blower motor will be inspected to verify that it is operating, the manometer will be checked to verify vacuum in the system and the sump lid will be inspected to verify that the seal is intact.

4.3.2.3 GSVS System Monitoring Devices and Alarms

A manometer installed in the system piping in the Mount Zion Church basement is the device used to monitor system operation and verify that negative pressure is being maintained.

4.3.2.4 GSVS Sampling Event Protocol

There are no sampling events associated with the GSVS system.

4.3.3 Oxygen Injection System

4.3.3.1 Oxygen Injection System Monitoring Schedule

During the first year of operation, the oxygen injection system will be monitored every other day for the first week, once a week for the next three weeks, and once every two months for the remainder of the year to establish baseline operating parameters/conditions, such as oxygen consumption, flow rates and routine pressure variations in the oxygen source and oxygen injection manifolds. After that, the system will be inspected based on the results of the first year of monitoring. Based upon present system oxygen flow rates, oxygen tank change-outs are expected to be performed every six months.

4.3.3.2 Oxygen Injection System General Equipment Monitoring

Oxygen injection system monitoring activities include the following:

- Initial monitoring
- Water level measurements
- Dissolved oxygen measurements
- Checking oxygen cylinders
- Balancing oxygen flow

Details of these procedures are included in the system O&M Plan included in **Appendix I** of this SMP. In addition to these activities, groundwater monitoring associated with the system is described in **Section 3** of this SMP.

4.3.3.3 Oxygen Injection System Monitoring Devices and Alarms

Equipment used to monitoring the system include the following:

- Water level meter
- Multi-parameter (YSI or similar) unit to measure DO
- Flow meters installed in each injection line
- Pressure regulators installed on the oxygen injection system manifold.

Details of these procedures for use of this equipment are included in the system O&M Plan included in **Appendix I** of this SMP.

4.3.3.4 Oxygen Injection System Sampling Event Protocol

Procedures for groundwater monitoring associated with the oxygen injection system are presented in **Section 3** of this SMP.

4.4 MAINTENANCE AND PERFORMANCE MONITORING REPORTING REQUIREMENTS

Maintenance reports and any other information generated during regular operations at the Controlled Properties will be kept on-file on-site in the Oxygen Injection System Treatment Shed. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the annual Periodic Review Report, as specified in the **Section 5** of this SMP.

4.4.1 Routine Maintenance Reports

Checklists or forms will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date;
- Name, company, and position of person(s) conducting maintenance activities;

- Maintenance activities conducted;
- Any modifications to the system;
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet); and,
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc., (attached to the checklist/form).

4.4.2 Non-Routine Maintenance Reports

During each non-routine maintenance event, a form will be completed which will include, but not be limited to, the following information:

- Date
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities;
- Presence of leaks
- Date of leak repair
- Other repairs or adjustments made to the system
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet)
- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form).

5.0 INSPECTIONS, REPORTING AND CERTIFICATIONS

5.1 SITE INSPECTIONS

All inspections shall be conducted by Con Edison using a qualified environmental professional ("QEP").

5.1.1 Inspection Frequency

All inspections will be conducted at the frequency specified in the schedules provided in **Section 3** of this SMP, Site Inspection and Monitoring Plan. At a minimum, an inspection of all Controlled Properties will be conducted annually. Inspections of the CCS, will also be conducted when the system is observed and or reported to be significantly compromised, whenever a severe condition has taken place at the Controlled Properties, such as an erosion or flooding event that may affect this EC, or whenever the CCS is restored following the performance of intrusive excavation work in the CCS.

5.1.2 Inspection Forms, Sampling Data and Maintenance Reports

A general inspection form will be completed during the annual inspection of all Controlled Properties and post severe weather inspections (see **Appendix F** of this SMP). Monitoring events will be recorded on the appropriate form in **Appendices H and I** of this SMP. Forms are subject to NYSDEC revision. Forms generated for the Controlled Properties during the reporting period will be included in the annual PRR.

5.1.3 Evaluation of Records and Reporting

The results of the inspection of the Controlled Properties and monitoring data collected for them will be evaluated as part of the EC/IC certification to confirm that the:

- EC/ICs are in place, are performing properly and remain effective.
- Operation and maintenance activities are being conducted properly.
- The condition of the Controlled Properties continues to be protective of public health and the environment and is performing as designed in the RASR and FER.

5.2 CERTIFICATION OF ENGINEERING AND INSTITUTIONAL CONTROLS

Information about EC/ICs can be found in the Engineering and Institutional Control Plan portion of the SMP. Inspection of the EC/ICs will occur at a frequency described in **Section 3** of this SMP.

5.2.1 Con Edison's Certification

After the last inspection of the reporting period, a qualified environmental professional ("QEP") or Professional Engineer ("PE") licensed to practice in New York State will prepare the following certification.

For each IC and EC identified for the Site, I certify that all of the following statements are true:

- The inspection of the Controlled Properties to confirm the effectiveness of the IC/EC, relevant to the composite cover system, sub-slab depressurization systems, groundwater sump vent system and oxygen injection system required by the remedial program was performed under my direction.
- The IC/EC, relevant to the composite cover system, sub-slab depressurization systems, groundwater sump vent system and oxygen injection system employed at Controlled Properties is unchanged from the date the control was put in place, or last approved by the NYSDEC.
- Nothing has occurred that would impair the ability of the control to protect the public health and environment.
- Nothing has occurred that would constitute a violation or failure to comply with any Site management plan for this control.

- Access to the Site will continue to be provided to the NYSDEC to evaluate the remedy, including access to evaluate the continued maintenance of this control.
- Use of each of the Controlled Properties is compliant with its respective Deed Restriction.
- The ECs, relevant to the composite cover system, sub-slab depressurization systems, groundwater sump vent system and oxygen injection system are performing as designed and are effective.

The report will also include the following certifications:

- To the best of my knowledge and belief, the work and conclusions described in the certification are in accordance with the requirements of the Site remedial program.
- The information presented in this report is accurate and complete.
- I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the New State Penal Law.

The signed certifications will be included in the Annual PRR described below

5.3 ANNUAL PERIODIC REVIEW REPORT

The annual Periodic Review Report ("PRR") for the Controlled Properties will be submitted to the NYSDEC every year, beginning eighteen months after the Certificate of Completion or equivalent document is issued by the NYSDEC for the Site. All site inspection forms completed during the reporting period will be reported as part of the Annual PRR. The report will be prepared in accordance with NYSDEC DER-10 and submitted within 45 days of the end of each certification period, and will include:

- Professional Engineer or qualified environmental person certification.
- Results of the required annual Controlled Property inspections and inspections performed following severe weather events, if applicable, generated for the Controlled Properties of the Site during the reporting period in electronic format.
- Identification, assessment and certification of all ECs/ICs required by the remedy for the Controlled Properties of the Site.
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, soil, air), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These will include a presentation of past data for comparison to previous Site conditions.
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted electronically in a NYSDEC-approved format.
- A Site evaluation, which includes the following:
  - Any new conclusions or observations regarding Site impacts based on inspections or other new data.
  - Recommendations regarding any necessary changes to the Monitoring Plan.
  - The overall performance and effectiveness of the EC.

The annual PRR will be submitted, in hard-copy format, to the NYSDEC Central Office and Regional Office in which the Site is located, and in electronic format to NYSDEC Central Office, Regional Office and the NYSDOH Bureau of Environmental Exposure Investigation.

5.4 CORRECTIVE MEASURES PLAN

If the CCS, SSDSs, GSVS and/or the oxygen injection system is/are found to have failed or been compromised, or if the periodic certification cannot be provided due to the failure of an institutional or engineering control, a corrective measures plan will be submitted by Con Edison to the NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the corrective measures plan until it is approved by the NYSDEC.

6.0 REFERENCES

AECOM, 2013. Final Engineering Report, Mount Vernon Former Manufactured Gas Plant Site, Westchester County, New York.

RETEC, May 2007. Remedial Action Selection Report, Mount Vernon Works, Former Manufactured Gas Plant Site, Mount Vernon, New York,

RETEC, May 2006. Remedial Investigation Report, Mount Vernon Works, Former Manufactured Gas Plant Site, Mount Vernon, New York,

RETEC, March 2004. Site Characterization Study Report Mount Vernon Works, Former Manufactured Gas Plant, Mount Vernon, New York. February 6, 2004.

RETEC, 2003. Site Characterization Study Work Plan Mount Vernon Works, Former Manufactured Gas Plan, Mount Vernon, New York, December 27, 2002.

NYSDEC, 2010, DER-10. Technical Guidance for Site Investigation and Remediation

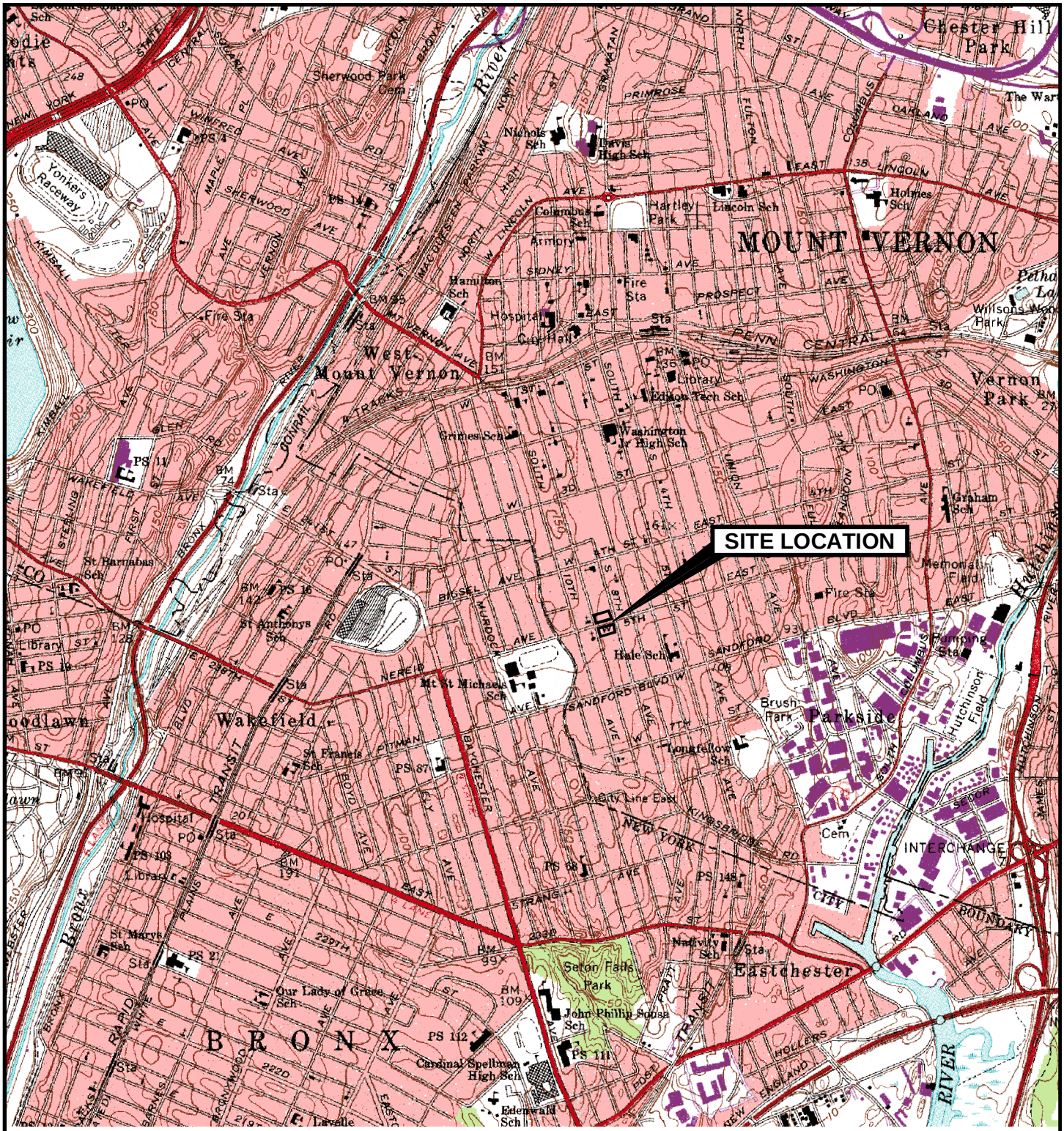
Tables

Table 3-2
Summary of Post-Remediation Groundwater Monitoring Program
Former MGP, Mount Vernon, New York

Monitoring Well Network	Screen Interval (ft bgs)	Sump Interval (ft bgs)	Ground Surface Elevation (NAVD88)	Top of Well Casing Elevation (NAVD88)	Analytical Program	
					BTEX	PAHs
MW-2	8 - 18	18 - 20	122.36	121.95	X	X
MW-4	7 - 17	17 - 19	120.73	120.08	X	X
MW-6	9 - 25	NS	120.30	119.72	X	X
MW-7	7 - 17	17 - 19	120.74	120.17	X	X
MW-10	10 - 20	20 - 22	121.88	121.34	X	X
MW-14	8 - 18	18 - 20	121.84	121.29	X	X
MW-15	9 - 19	19 - 21	124.12	123.40	X	X
MW-16	8 - 18	NS	119.09	118.80	X	X
MW-17	8 - 18	18 - 20	120.95	120.69	X	X
MW-18	7 - 17	17 - 18	119.66	119.41	X	X
MW-19	7 - 17	17 - 19	118.72	118.44	X	X
MW-20	9 - 19	19 - 21	120.08	119.74	X	X

Notes:
ft bgs - feet below ground surface
NS - No Sump
All wells completed flush to grade.
NAVD88 - North American Vertical Datum of 1988
Analysis of BTEX using US EPA analytical method 8260.
Analysis of PAHs using US EPA analytical method 8270.
Groundwater samples will be collected following US EPA's low-flow groundwater sampling procedures.

Figures



UNITED STATES GEOLOGIC SURVEY
MOUNT VERNON QUADRANGLE
NEW YORK
7.5 MINUTE SERIES (TOPOGRAPHY)

MOUNT VERNON, N.Y.
1966
PHOTOREVISED 1979

SCALE 1:24000

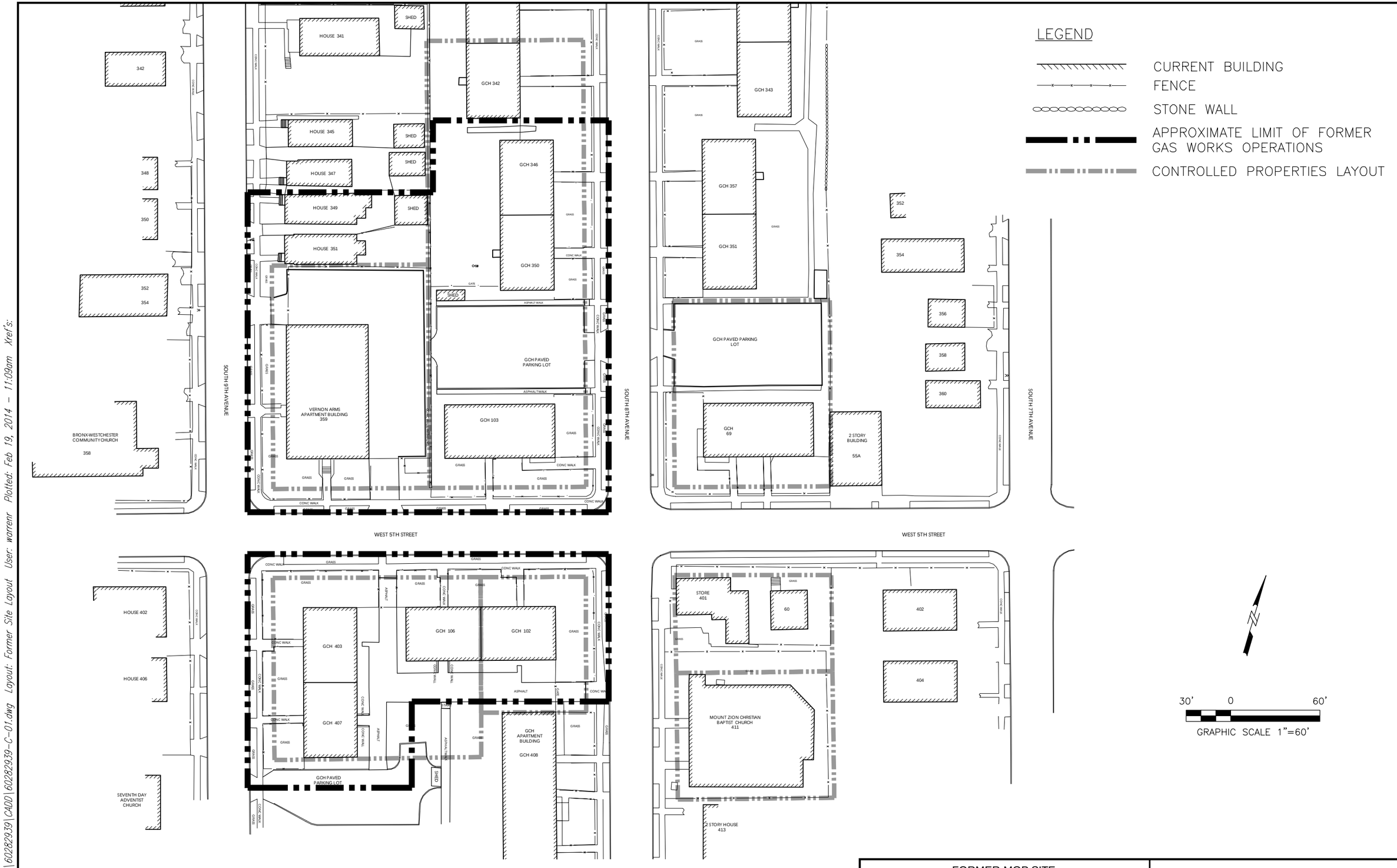
1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**SITE LOCATION MAP**
DATE: 02/14/14	DRWN: RCW		**FIGURE 1-1**

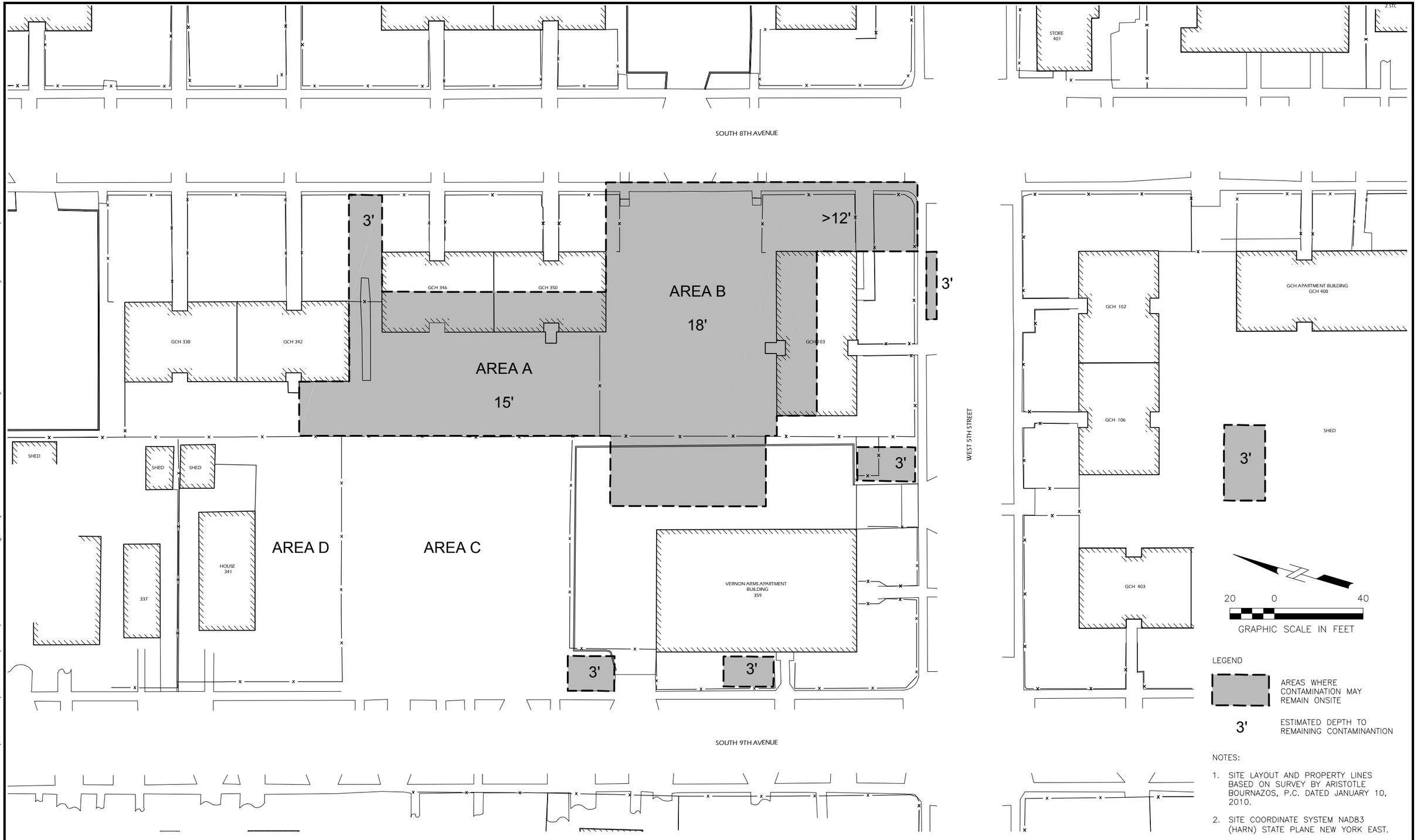
File: F:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-SL-01.dwg Layout: Site Location User: warrenr Plotted: Feb 14, 2014 - 10:25am Xref's:



AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200				**FORMER SITE LAYOUT AND CONTROLLED PROPERTIES LAYOUT**
DATE: 02/14/14	DRWN: RCW			**FIGURE 1-2**

File: C:\WORK\60282939\CADD\60282939-C-01.dwg Layout: Former Site Layout User: warrenr Plotted: Feb 19, 2014 – 11:09am Xref's:



LEGEND

AREAS WHERE CONTAMINATION MAY REMAIN ONSITE

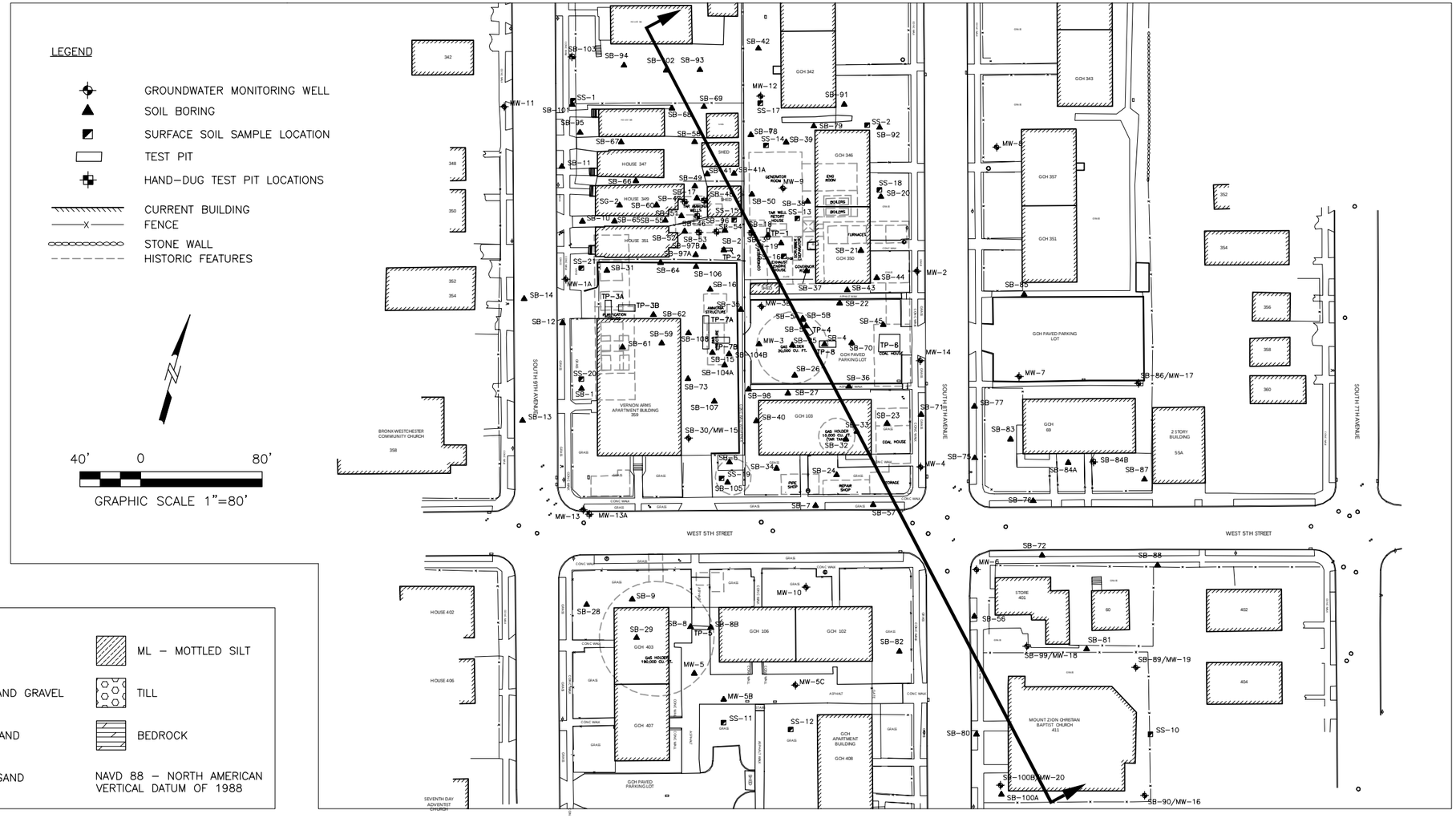
3' ESTIMATED DEPTH TO REMAINING CONTAMINANTION

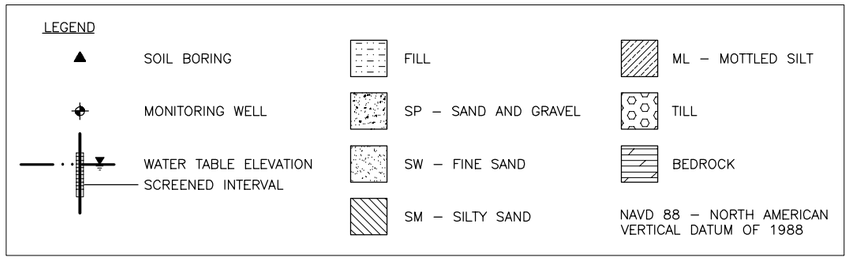
NOTES:

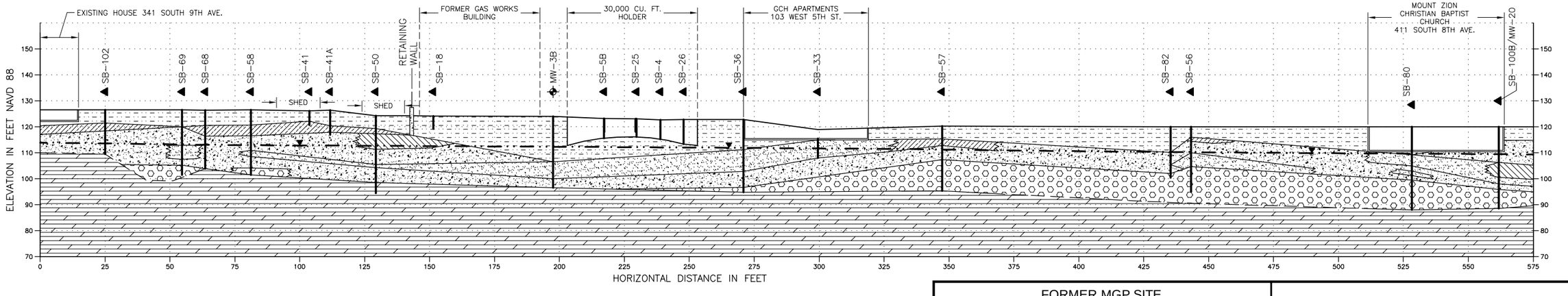
1. SITE LAYOUT AND PROPERTY LINES BASED ON SURVEY BY ARISTOTLE BOURNAZOS, P.C. DATED JANUARY 10, 2010.
2. SITE COORDINATE SYSTEM NAD83 (HARN) STATE PLANE NEW YORK EAST.

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**LOCATIONS WHERE CONTAMINATION MAY REMAIN IN EXCAVATION AREAS**
DATE: 09/15/14	DRWN: RCW		**FIGURE 1-3**







HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 40'

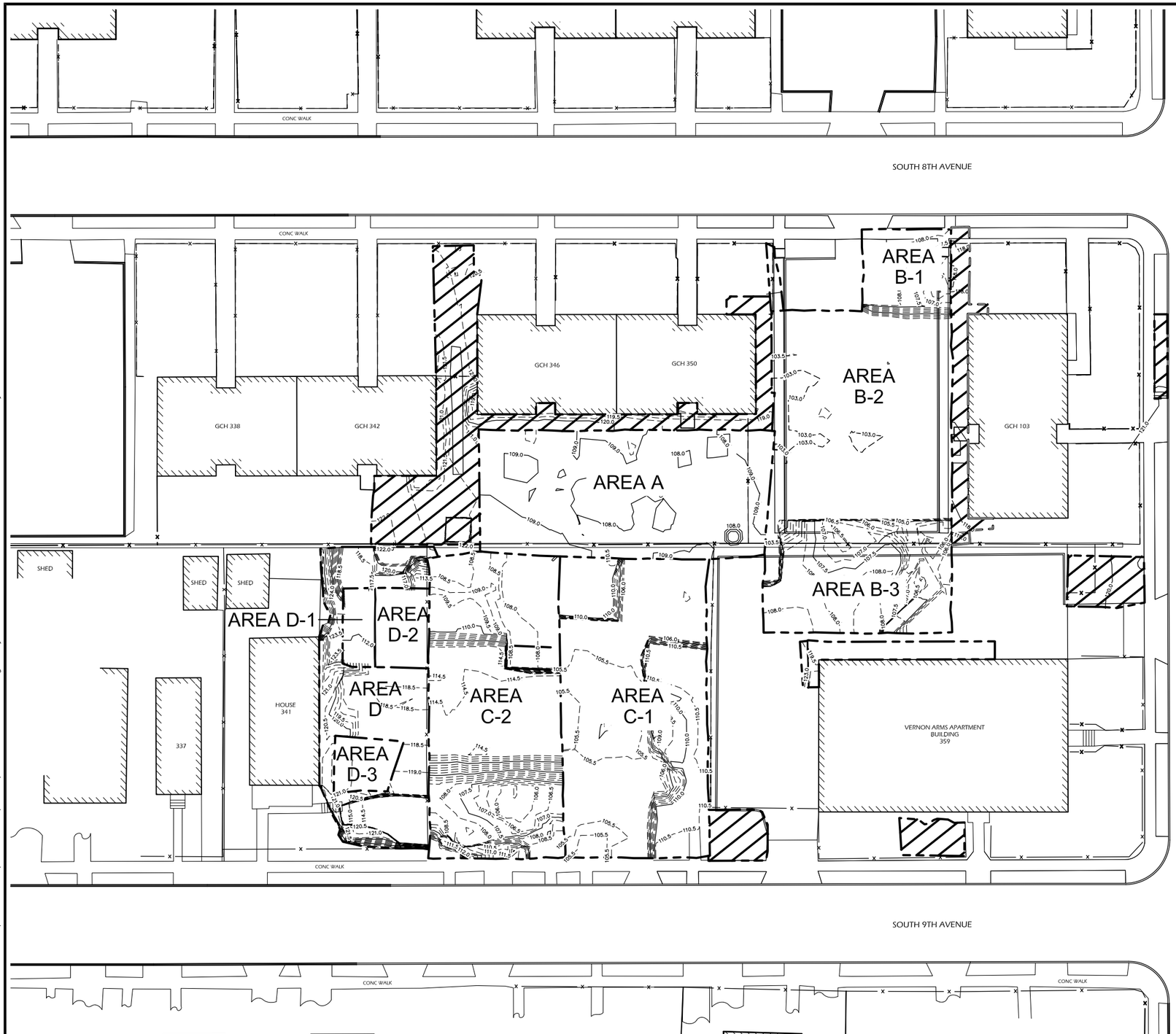
NOTES: SOIL BORINGS SB-80 AND SB-100B/MW-20 INSTALLED TO THE WEST OF THE MOUNT ZION CHRISTIAN BAPTIST CHURCH. SOIL BORING SB-33 INSTALLED THROUGH BASEMENT OF GCH APARTMENTS 103 WEST 5TH ST.

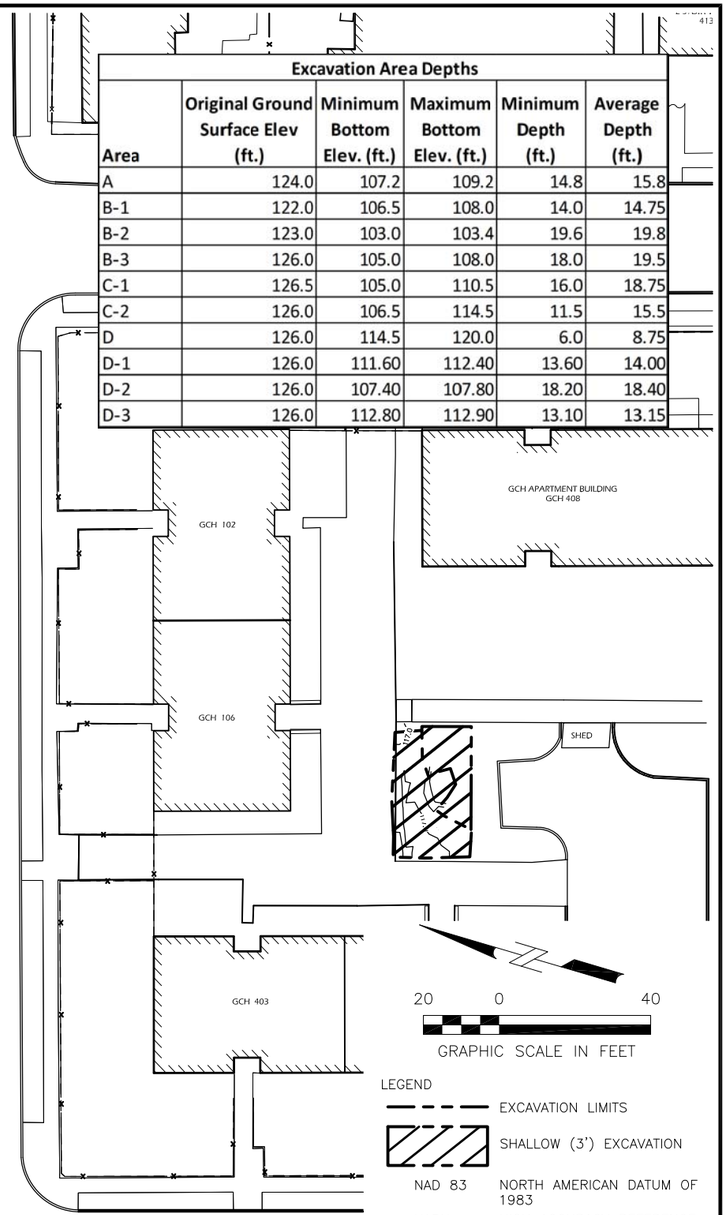
FORMER MGP SITE
MOUNT VERNON, NEW YORK
60282939-200

GEOLOGIC CROSS SECTION

DATE: 02/18/14 | DRWN: RCW | **FIGURE 1-4**

File: C:\WORK\60282939\CADD\60282939-X-01.dwg Layout: E-E User: warrenr Plotted: Feb 19, 2014 - 11:11am Xref's:





Excavation Area Depths

Area	Original Ground Surface Elev (ft.)	Minimum Bottom Elev. (ft.)	Maximum Bottom Elev. (ft.)	Minimum Depth (ft.)	Average Depth (ft.)
A	124.0	107.2	109.2	14.8	15.8
B-1	122.0	106.5	108.0	14.0	14.75
B-2	123.0	103.0	103.4	19.6	19.8
B-3	126.0	105.0	108.0	18.0	19.5
C-1	126.5	105.0	110.5	16.0	18.75
C-2	126.0	106.5	114.5	11.5	15.5
D	126.0	114.5	120.0	6.0	8.75
D-1	126.0	111.60	112.40	13.60	14.00
D-2	126.0	107.40	107.80	18.20	18.40
D-3	126.0	112.80	112.90	13.10	13.15

20 0 40

GRAPHIC SCALE IN FEET

LEGEND

EXCAVATION LIMITS

SHALLOW (3') EXCAVATION

NAD 83 NORTH AMERICAN DATUM OF 1983

HARN HIGH ACCURACY REFERENCE NETWORK

NOTES:

1. SITE LAYOUT BASED ON SURVEY BY ARISTOTLE BOURNAZOS, P.C. DATED JANUARY 10, 2010.
2. BOTTOM OF EXCAVATION ELEVATIONS AND EXTENT OF EXCAVATIONS BASED ON SURVEY PREPARED BY WEBER SURVEYORS.
3. SITE COORDINATE SYSTEM NAD83 (HARN) STATE PLANE NEW YORK EAST.

AECOM

FORMER MGP SITE
MOUNT VERNON, NEW YORK
60282939-200

REMEDIAL ACTION EXCAVATION AREAS

DATE: 02/18/14 | DRWN: RCW

FIGURE 1-5

File: F:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-G-02.dwg Layout: Remedial Action Excav Areas User: barryk Plotted: Mar 20, 2014 - 9:26am Xref's:

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**GROUNDWATER ELEVATION CONTOUR AND FLOW MAP BASED ON MEASUREMENTS TAKEN JUNE 6, 2005**
DATE: 02/18/14	DRWN: RCW		**FIGURE 1-6**

File: F:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-C-03.dwg Layout: GW 6-6-05 User: baryk Plotted: Mar 20, 2014 - 9:41am Xref's:

LEGEND

- GROUNDWATER MONITORING WELL
- SOIL BORING
- SURFACE SOIL SAMPLE LOCATION
- TEST PIT
- MINI-TEST PIT LOCATIONS
- CURRENT BUILDING
- FENCE
- STONE WALL
- EXTENT OF OBSERVED TAR-LIKE MATERIAL
- EXTENT OF SOIL WITH TOTAL SVOCs >500 PPM
- EXTENT OF SOILS WITH TOTAL VOCs >10 PPM

30' 0 60'

GRAPHIC SCALE 1"=60'

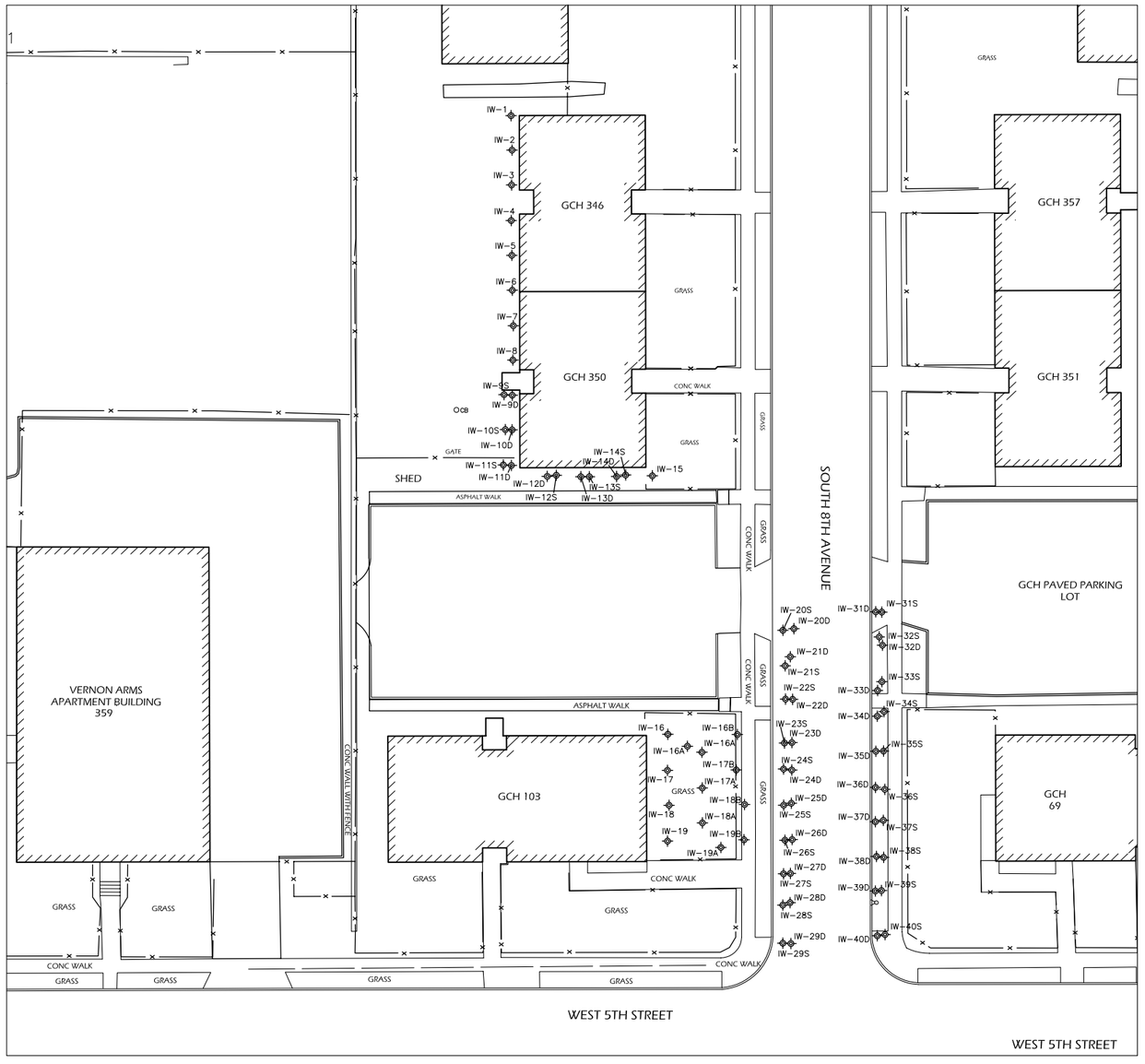
AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**AREAL EXTENT OF OBSERVED MGP IMPACTS IN UNCONSOLIDATED SOILS PRIOR TO REMEDIATION**
DATE: 02/18/14	DRWN: RCW		**FIGURE 1-7**

File: C:\WORK\60282939\CADD\60282939-C-01.dwg Layout: Fig 1-8 Limits GW Impact User: warrenr Plotted: Feb 19, 2014 - 11:17am Xref's:

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**LIMITS OF GROUNDWATER IMPACTS**	
DATE: 02/18/14	DRWN: RCW/CON			**FIGURE 1-8**



IN SITU CHEMICAL OXIDATION WELL LAYOUT

SCALE = 1" = 40'

20 0 40

GRAPHIC SCALE IN FEET

LEGEND

CURRENT BUILDING

FENCE

IW-1 ISCO INJECTION WELL LOCATION AND DESIGNATION

NOTE:

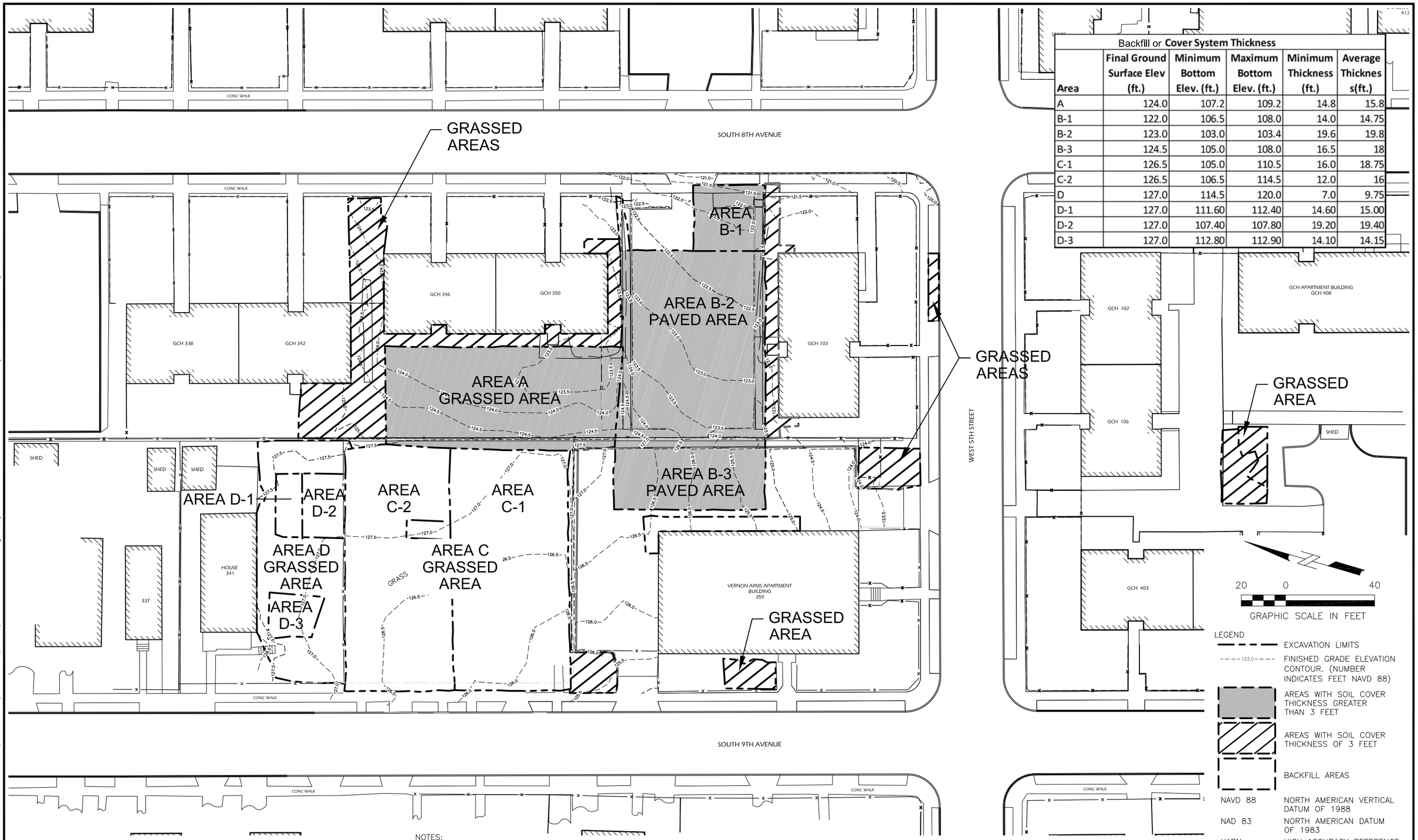
1. ISCO INJECTION WELL LOCATIONS BASED ON SURVEY BY LUIS WEBER ASSOCIATES ON OCTOBER 11, 2011.

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**IN SITU CHEMICAL OXIDATION WELL LAYOUT**
DATE: 04/25/14	DRWN: RCW		**FIGURE 1-9**

File: F:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-IC-01.dwg Layout: ISCO Site Layout User: warrenr Plotted: Apr 25, 2014 - 12:50pm Xref's:

Backfill or Cover System Thickness					
Area	Final Ground Surface Elev (ft.)	Minimum Bottom Elev. (ft.)	Maximum Bottom Elev. (ft.)	Minimum Thickness (ft.)	Average Thicknes s(ft.)
A	124.0	107.2	109.2	14.8	15.8
B-1	122.0	106.5	108.0	14.0	14.75
B-2	123.0	103.0	103.4	19.6	19.8
B-3	124.5	105.0	108.0	16.5	18
C-1	126.5	105.0	110.5	16.0	18.75
C-2	126.5	106.5	114.5	12.0	16
D	127.0	114.5	120.0	7.0	9.75
D-1	127.0	111.60	112.40	14.60	15.00
D-2	127.0	107.40	107.80	19.20	19.40
D-3	127.0	112.80	112.90	14.10	14.15



NOTES:

1. SITE LAYOUT BASED ON SURVEY BY ARISTOTLE BOURNAZOS, P.C. DATED JANUARY 10, 2010.
2. FINAL ELEVATIONS BASED ON SURVEY PREPARED BY WEBER SURVEYORS.
3. SITE COORDINATE SYSTEM NAD83 (HARN) STATE PLANE NEW YORK EAST.
4. THE NORTH AMERICAN VERTICAL DATUM OF 1988 IS THE VERTICAL CONTROL DATUM ESTABLISHED FOR SURVEYING IN THE UNITED STATES.

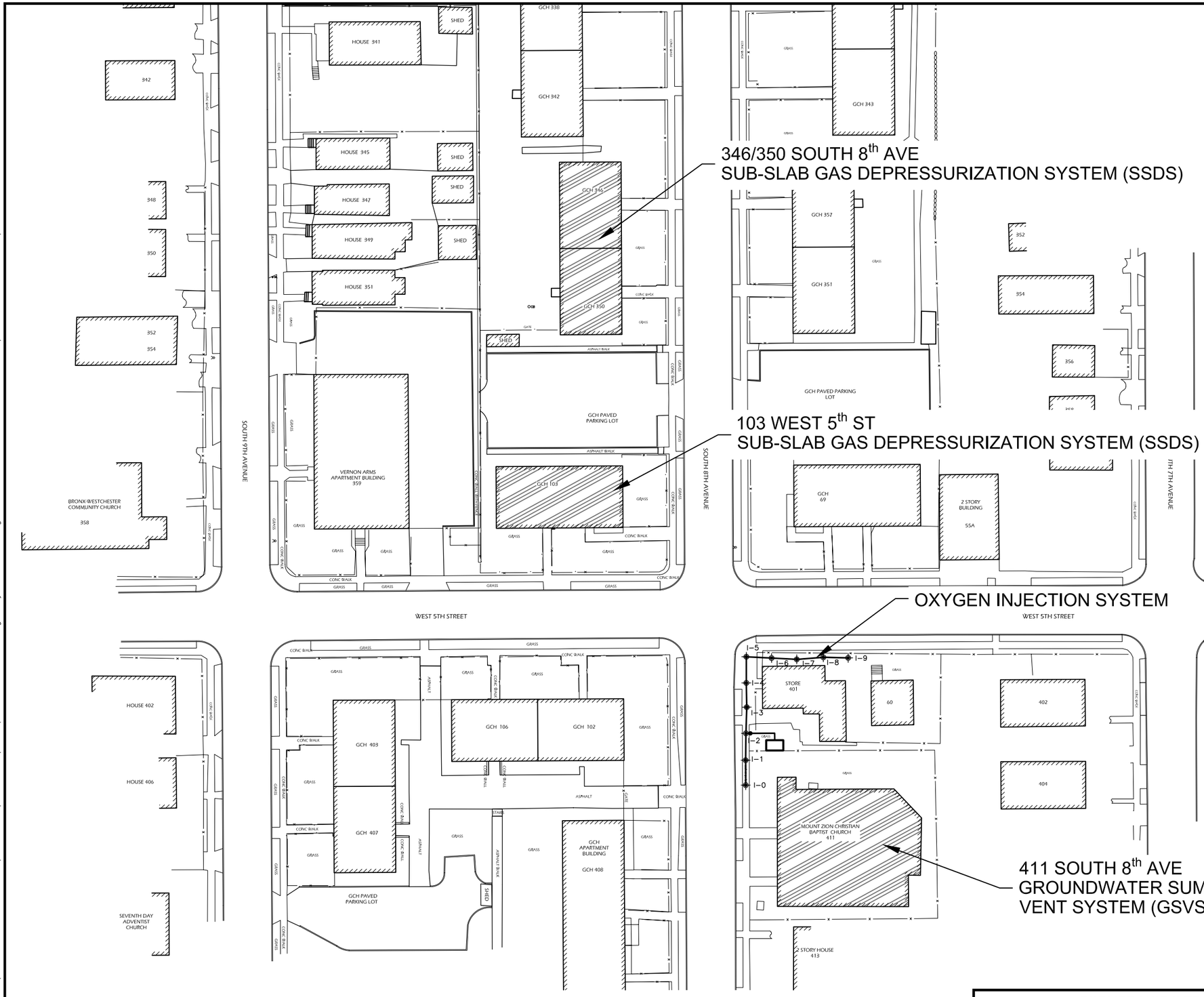
AECOM

FORMER MGP SITE
MOUNT VERNON, NEW YORK
60282939-200

DATE: 02/18/14 | DRWN: RCW

BACKFILL PLACEMENT LOCATIONS, COVER SYSTEM PLAN, AND FINISHED GRADE ELEVATIONS

FIGURE 2-1



LEGEND

- CURRENT BUILDING
- FENCE
- STONE WALL
- OXYGEN INJECTION POINTS
- ACTIVE ENGINEERING CONTROLS

NOTE:

1. OXYGEN INJECTION WELL LOCATIONS BASED ON SURVEY BY LUIS WEBER ASSOCIATES.

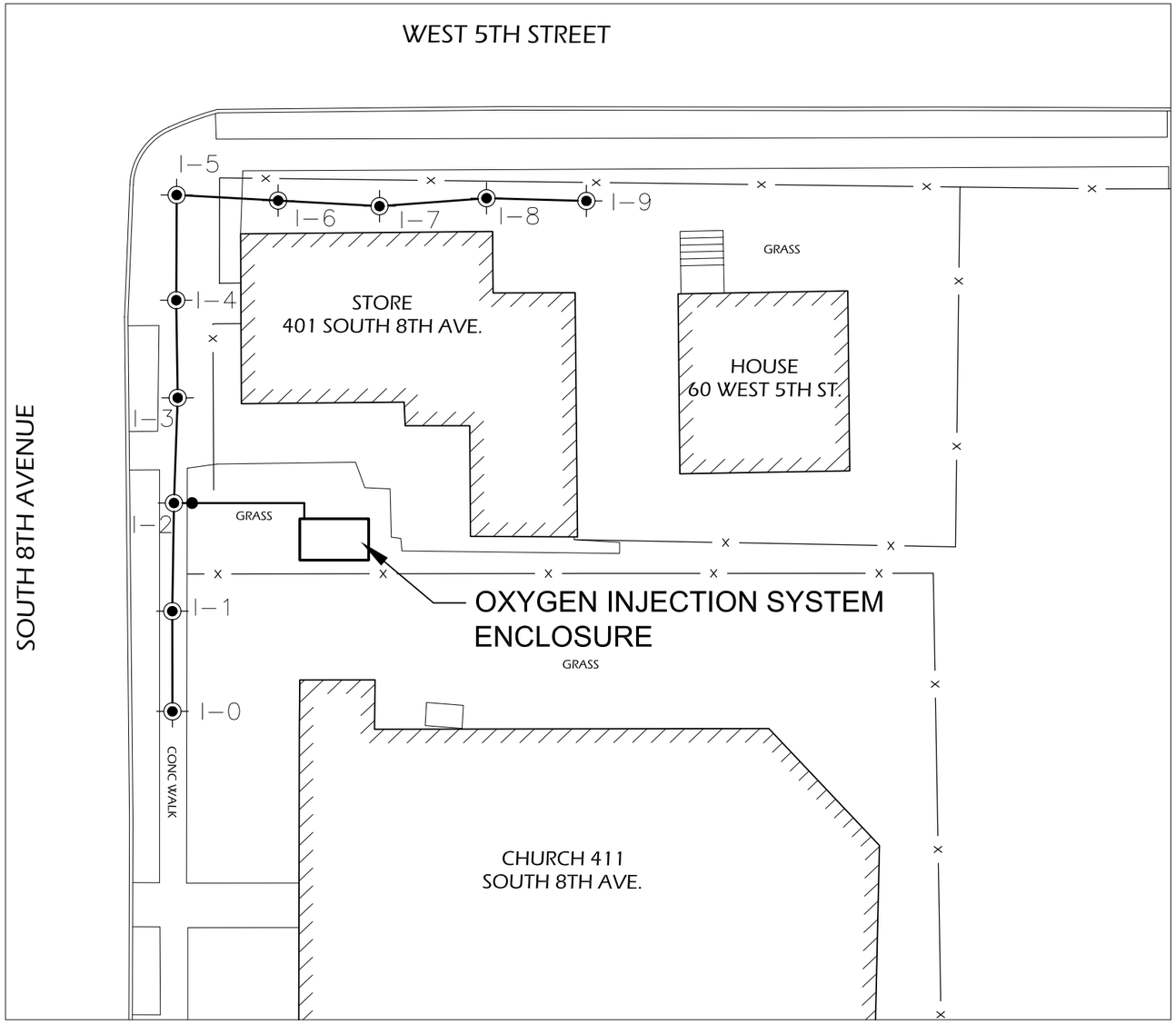
30' 0 60'

GRAPHIC SCALE 1"=60'

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**ACTIVE ENGINEERING CONTROLS**
DATE: 04/25/14	DRWN: RCW		**FIGURE 2-2**

File: F:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-C-01.dwg Layout: Active Eng Controls User: warrenr Plotted: Apr 25, 2014 - 12:52pm Xref's:



OXYGEN INJECTION WELL LOCATIONS

SCALE = 1" = 20'

N

10 0 20

GRAPHIC SCALE IN FEET

LEGEND

CURRENT BUILDING

FENCE

I–5 OXYGEN INFUSION WELL LOCATION AND DESIGNATION

NOTE:

1. LOCATION OF INJECTION POINT I–6 IS APPROXIMATE.
2. OXYGEN INJECTION WELL LOCATIONS BASED ON SURVEY BY LUIS WEBER ASSOCIATES.

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**OXYGEN INJECTION SYSTEM LAYOUT**
DATE: 04/25/14	DRWN: RCW		**FIGURE 2-3**

File: F:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-IC-01.dwg Layout: Oxy Inj Well Locs User: warrenr Plotted: Apr 25, 2014 - 1:17pm Xref's:

LEGEND

- BUILDING
- FENCE
- DEED RESTRICTION AREA AND SITE MANAGEMENT PLAN APPLIES
- SITE MANAGEMENT PLAN ONLY AREAS

} THESE AREAS ENCOMPASS THE **CONTROLLED PROPERTIES**

- C — **CONTROLLED BUILDING**

AREAS WHERE SUBSURFACE ACTIVITIES ARE SUBJECT TO THE EXCAVATION WORK PLAN

- EXCAVATIONS > 3 FT BGS. REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS > 15 FT BGS. REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS > 18 FT BGS REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS BELOW CONTROLED BULDINGS
- EXCAVATIONS BELOW 2 FT BGS IN AREAS WITHOUT ISOLATION CAP OR NOT COVERED BY CONTROLLED BUILDING.
- EXCAVATIONS BELOW GROUNDWATER TABLE (APPROXIMATELY 12FT. BGS)
- EXCAVATIONS OF SOIL BELOW 10 FT BGS AT IN-PLACE TREATMENT AREA.

FT BGS – FEET BELOW GROUND SURFACE

30' 0 60'

GRAPHIC SCALE 1"=60'

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**INSTITUTIONAL CONTROLS AND AREAS SUBJECT TO THE EXCAVATION WORK PLAN**
DATE: 09/15/14	DRWN: RCW		**FIGURE 2-4**

File: T:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-C-05.dwg Layout: 2-4 Institutional Controls User: bourdeauj Plotted: Sep 15, 2014 - 6:14pm Xref's:

LEGEND

- GROUNDWATER MONITORING WELL
- CURRENT BUILDING
- FENCE
- STONE WALL
- HISTORIC FEATURES
- I-5 OXYGEN INFUSION WELL LOCATION AND DESIGNATION

NOTE:

1. LOCATION OF INJECTION POINT I-6 IS APPROXIMATE.
2. OXYGEN INJECTION WELL LOCATIONS BASED ON SURVEY BY LUIS WEBER ASSOCIATES.

20 0 40

GRAPHIC SCALE 1"=40'

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**GROUNDWATER MONITORING WELL NETWORK**
DATE: 04/25/14	DRWN: RCW		**FIGURE 3-1**

File: T:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-C-03.dwg Layout: GW MW Network User: bourdeauj Plotted: Sep 15, 2014 - 7:05pm Xref's:

Appendix A

Metes and Bounds

PARCEL DESCRIPTION

Dated: March 25, 2014

Section 169.38, Block 3057, Lot 15 on the current Official Tax Map of the City of Mount Vernon County of Westchester

Parcel #1-Deed Restriction Area

ALL THAT CERTAIN PARCEL OF LAND SITUATE IN THE CITY OF MOUNT VERNON, COUNTY OF WESTCHESTER, AND STATE OF NEW YORK, BEING BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A COPPERWELD FOUND AT THE INTERSECTION OF THE NORTHERLY SIDE OF WEST 5TH STREET WITH THE EASTERLY SIDE OF SOUTH 9TH AVENUE AS SHOWN ON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144; THENCE NORTHERLY ALONG THE EASTERLY SIDE OF SOUTH 9TH AVENUE, NORTH 11 DEGREES 08 MINUTES 52 SECONDS WEST, 150.29 FEET;

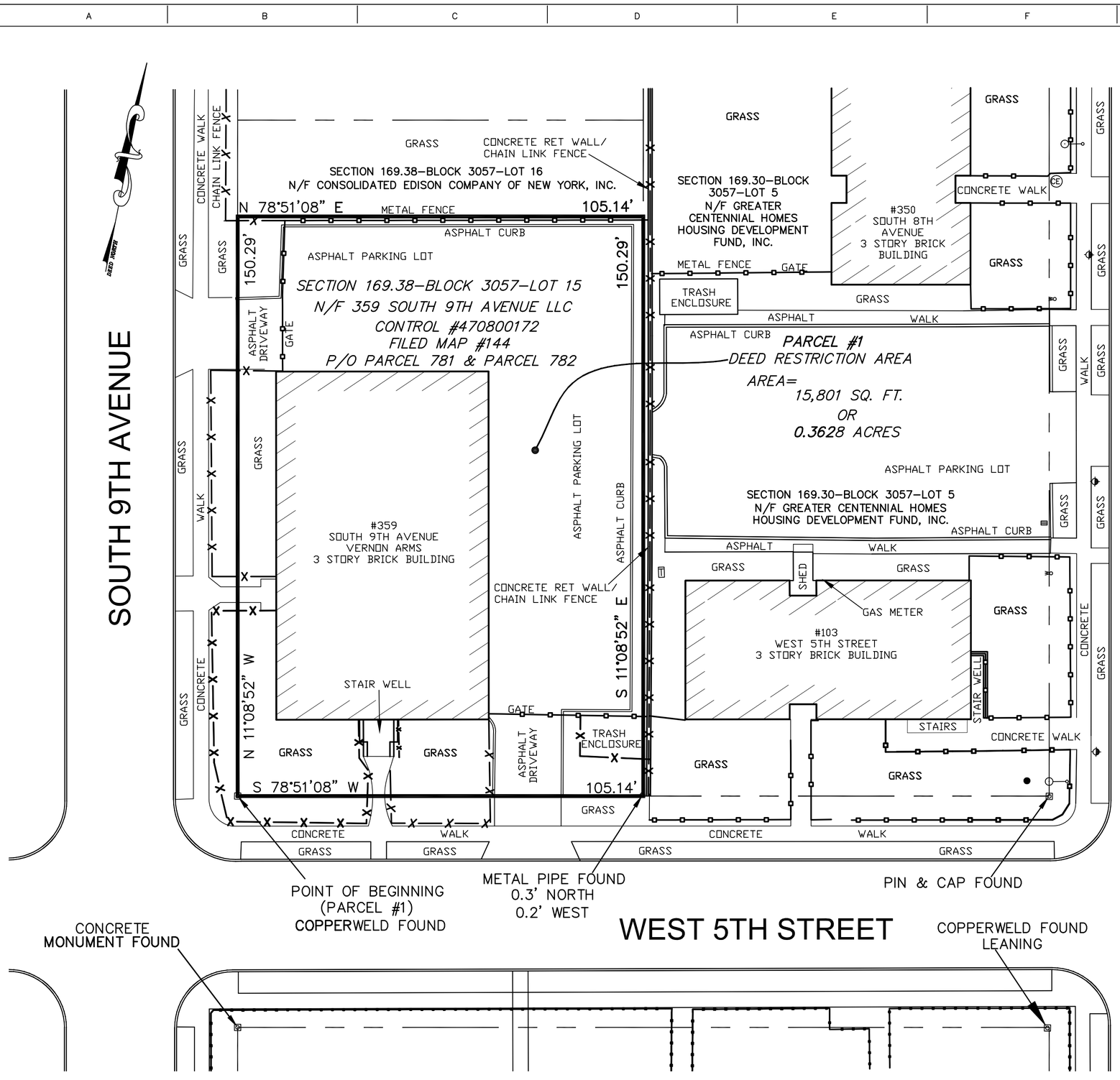
THENCE EASTERLY ALONG THE NORTHERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, NORTH 78 DEGREES 51 MINUTES 08 SECONDS EAST, 105.14 FEET;

THENCE SOUTHERLY ALONG THE EASTERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 11 DEGREES 08 MINUTES 52 SECONDS EAST, 150.29 FEET TO THE NORTEHRLY SIDE OF WEST 5TH STREET;

THENCE WESTERLY ALONG THE NORTHERLY SIDE OF WEST 5TH STREET, SOUTH 78 DEGREES 51 MINUTES 08 SECONDS WEST, 105.14 FEET TO THE POINT OR PLACE OF BEGINNING.

CONTAINING 15,801 SQUARE FEET OR 0.3628 ACRES MORE OR LESS.

BEING THE SAME PROPERTY DESCRIBED IN DEED FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE
- P/O — PART OF

REVISION
USE .1 SIZE TEXT ONLY

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES THE ENTIRE TAX LOT KNOWN AS SECTION 169.38–BLOCK 3057–LOT 15 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION SIGNATURES

REV	

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
#359 SOUTH 9TH AVENUE
NEW YORK STATE
10550

Date	Job Number		Rev
8/29/13	C125.09	PHONE (914)–773–1701 FAX (914)–773–1706	

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

DWG. NO. 00–0000–0

conEdison

DWG. TYPE SURVEY
DWG. SIZE C

LOCATION: #359 SOUTH 9TH AVENUE

SHEET–1 OF 1

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN
SURVEY SUPERVISOR: J. CARPENTER
SURVEYOR: JOHN GERD HEIDECKER., L.S.
WELSH ENGR./LAND SURVG,P.C.
DRAWN BY: J.H.
DATE: 8–29–2013
SCALE: 1"= 20'
DISCIPLINE CODE: SU

PARCEL DESCRIPTION

Dated: March 25, 2014

Section 169.30, Block 3057, Lot 5 on the current Official Tax Map of the City of Mount Vernon County of Westchester.

Parcel #2- Deed Restriction Area

ALL THAT CERTAIN PARCEL OF LAND SITUATE IN THE CITY OF MOUNT VERNON, COUNTY OF WESTCHESTER, AND STATE OF NEW YORK, BEING BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A PIN AND CAP FOUND AT THE INTERSECTION OF THE NORTHERLY SIDE OF WEST 5TH STREET WITH THE WESTERLY SIDE OF SOUTH 8TH AVENUE AS SHOWN ON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144; THENCE WESTERLY ALONG THE NORTHERLY SIDE OF WEST 5TH STREET, SOUTH 78 DEGREES 51 MINUTES 08 SECONDS WEST, 105.22 FEET;

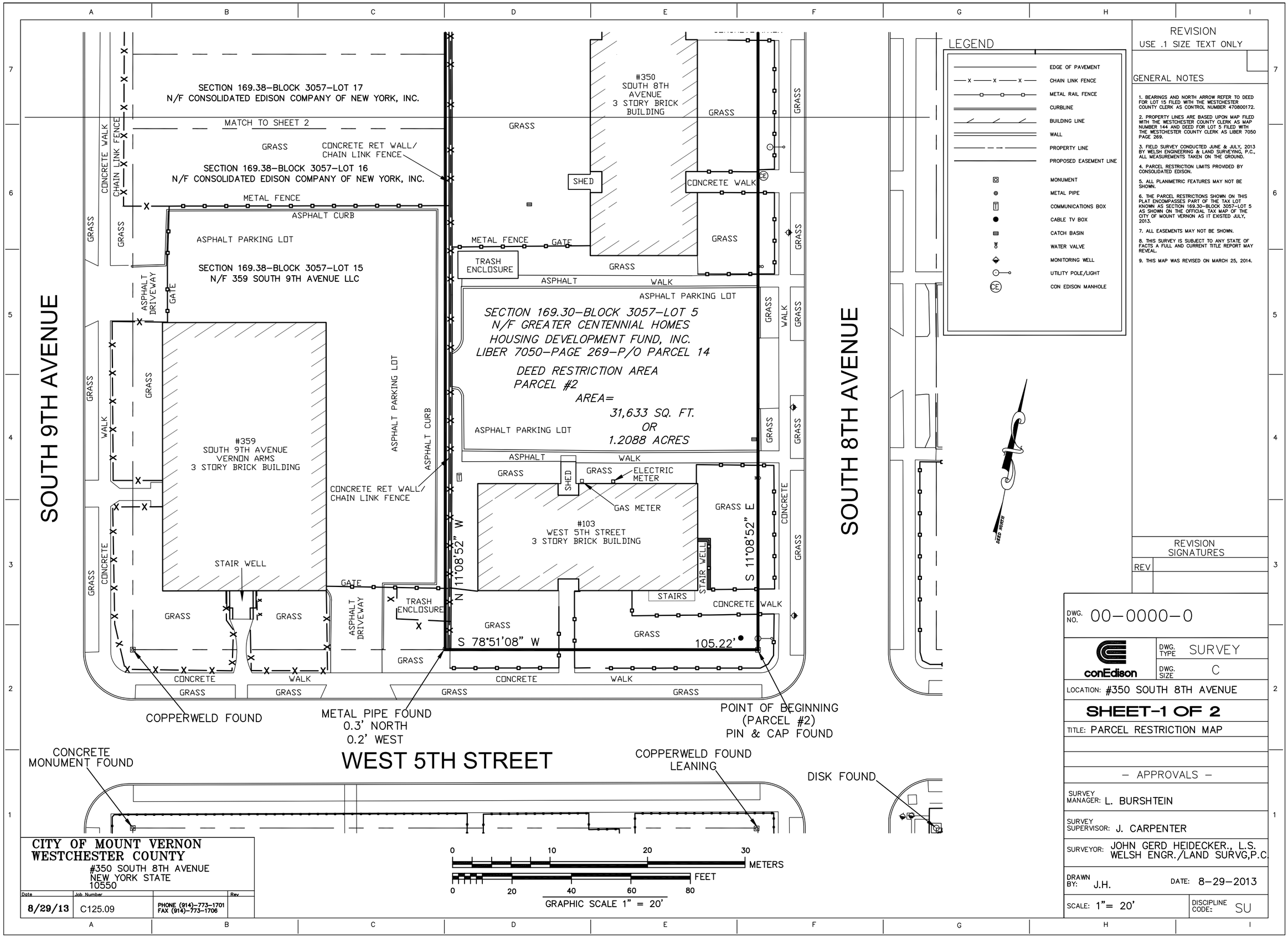
THENCE NORTHERLY ALONG THE WESTERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, NORTH 11 DEGREES 08 MINUTES 52 SECONDS WEST, 300.64 FEET;

THENCE EASTERLY ALONG THE NORTHERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, NORTH 78 DEGREES 51 MINUTES 08 SECONDS EAST, 105.22 FEET TO THE WESTERLY SIDE OF SOUTH 8TH AVENUE;

THENCE SOUTHERLY ALONG THE WESTERLY SIDE OF SOUTH 8TH AVENUE, SOUTH 11 DEGREES 08 MINUTES 52 SECONDS EAST, 300.64 FEET TO THE POINT OR PLACE OF BEGINNING.

CONTAINING 31,633 SQUARE FEET OR 1.2088 ACRES MORE OR LESS.

BEING THE SAME PROPERTY DESCRIBED IN DEED FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050-PAGE 269; BEING PART OF PARCEL 14.



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

DEED NORTH

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

REVISION

USE .1 SIZE TEXT ONLY

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 5 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES PART OF THE TAX LOT KNOWN AS SECTION 169.30–BLOCK 3057–LOT 5 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION SIGNATURES

REV

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
#350 SOUTH 8TH AVENUE
NEW YORK STATE
10550

Date	Job Number		Rev
8/29/13	C125.09	PHONE (914)–773–1701 FAX (914)–773–1706	

DWG. NO. 00–0000–0

conEdison

DWG. TYPE: SURVEY
DWG. SIZE: C

LOCATION: #350 SOUTH 8TH AVENUE

SHEET–1 OF 2

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

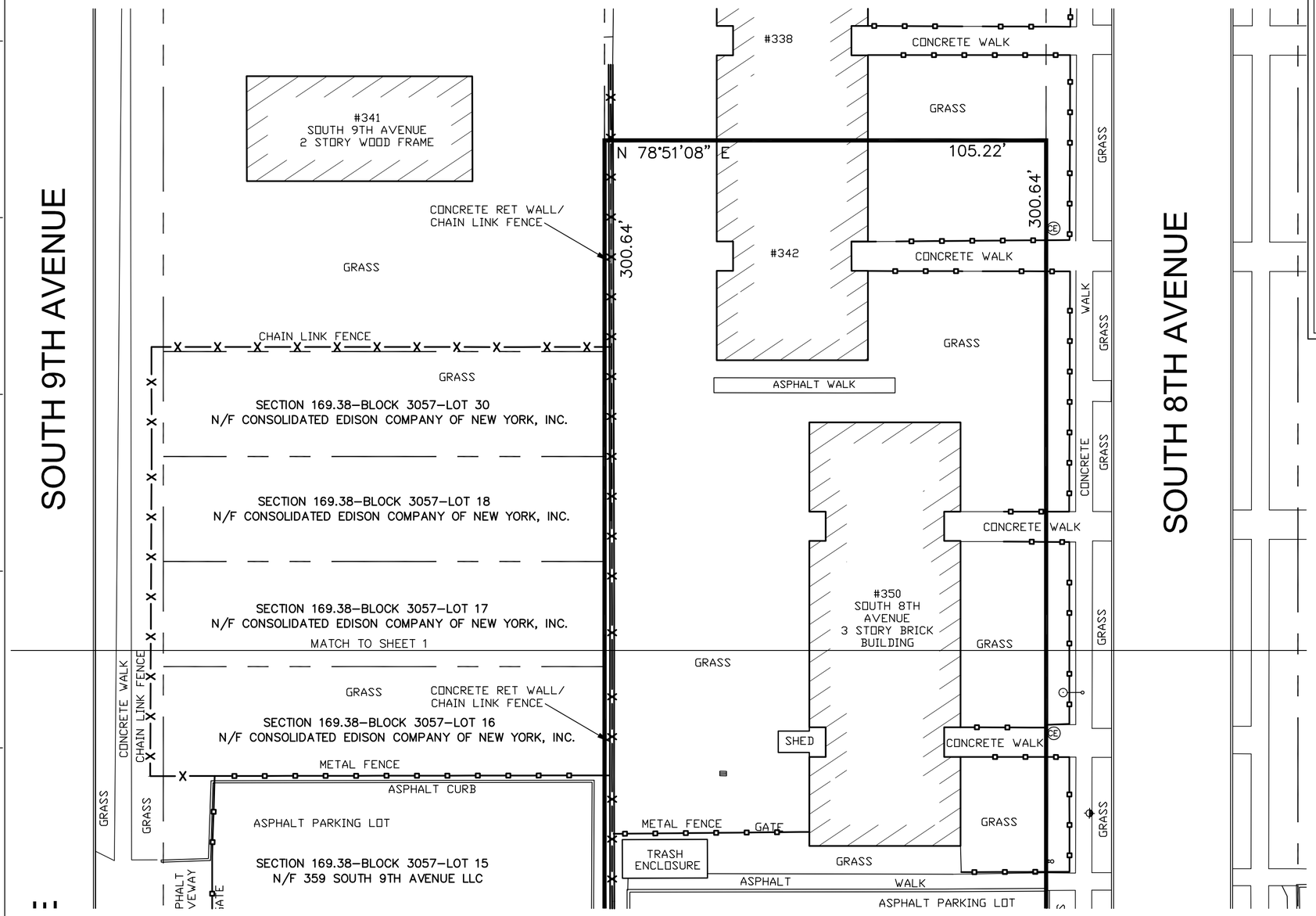
SURVEY MANAGER: L. BURSHTEIN

SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
WELSH ENGR./LAND SURVG,P.C.

DRAWN BY: J.H. DATE: 8–29–2013

SCALE: 1"= 20' DISCIPLINE CODE: SU



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

GRID NORTH

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 5 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES PART OF THE TAX LOT KNOWN AS SECTION 169.30–BLOCK 3057–LOT 5 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
#350 SOUTH 8TH AVENUE
NEW YORK STATE
10550

Date	Job Number		Rev
8/29/13	C125.09	PHONE (914)–773–1701 FAX (914)–773–1706	

DWG. NO. 00–0000–0

conEdison

DWG. TYPE SURVEY
DWG. SIZE C

LOCATION: #350 SOUTH 8TH AVENUE

SHEET–2 OF 2

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN

SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
WELSH ENGR./LAND SURVG,P.C.

DRAWN BY: J.H. DATE: 8–29–2013

SCALE: 1"= 20' DISCIPLINE CODE: SU

PARCEL DESCRIPTION

Dated: March 25, 2014

Section 169.30, Block 3064, Lot 26 on the current Official Tax Map of the City of Mount Vernon County of Westchester.

Parcel #3- Site Management Plan Only

ALL THAT CERTAIN PARCEL OF LAND SITUATE IN THE CITY OF MOUNT VERNON, COUNTY OF WESTCHESTER, AND STATE OF NEW YORK, BEING BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTHERLY SIDE OF WEST 5TH STREET WITH THE EASTERLY SIDE OF SOUTH 8TH AVENUE AS SHOWN ON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144; THENCE NORTHERLY ALONG THE EASTERLY SIDE OF SOUTH 8TH AVENUE, NORTH 11 DEGREES 08 MINUTES 52 SECONDS WEST, 125.21 FEET;

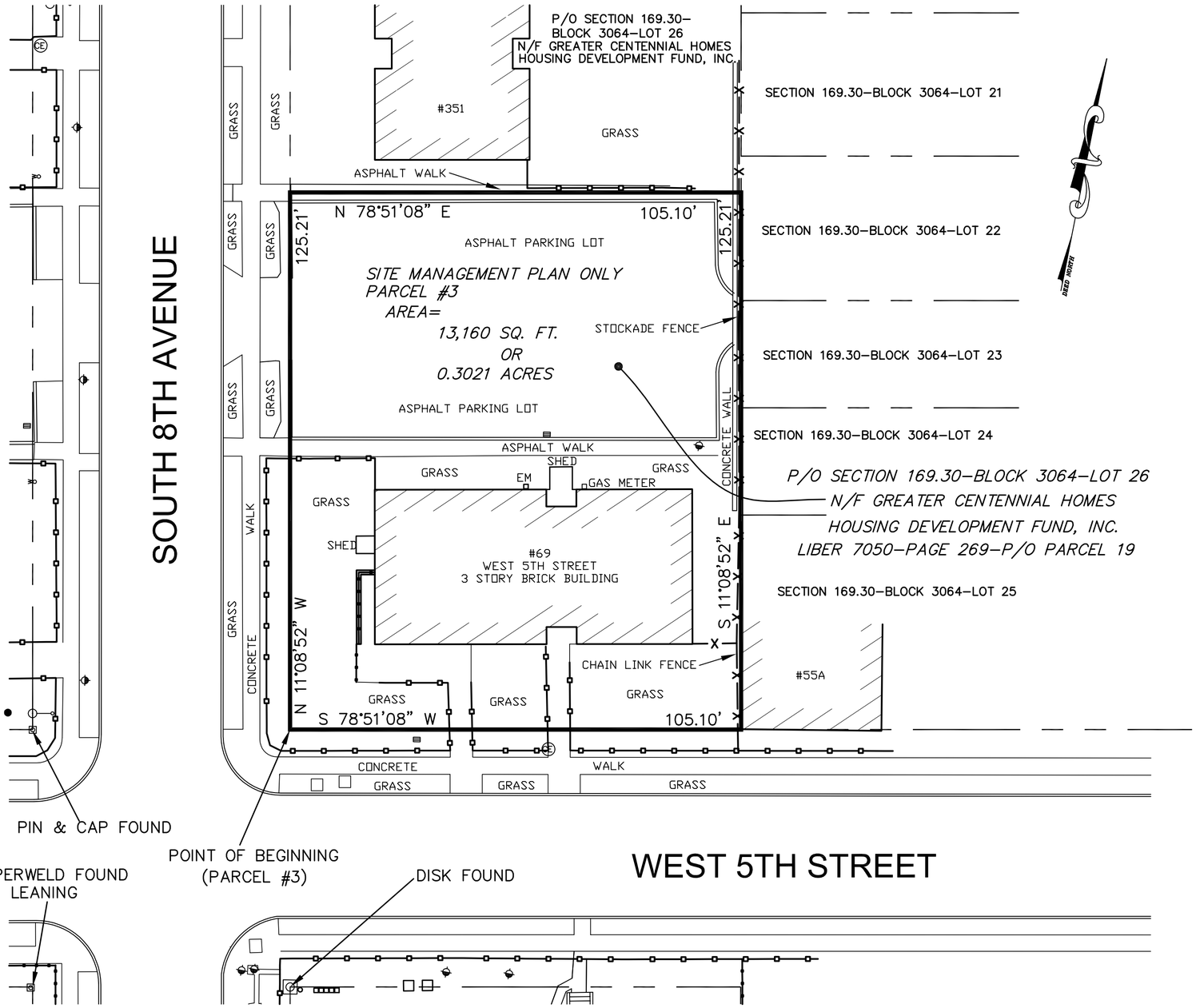
THENCE EASTERLY ALONG THE NORTHERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, NORTH 78 DEGREES 51 MINUTES 08 SECONDS EAST, 105.10 FEET;

THENCE SOUTHERLY ALONG THE EASTERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 11 DEGREES 08 MINUTES 52 SECONDS EAST, 125.21 FEET TO THE NORTEHRLY SIDE OF WEST 5TH STREET;

THENCE WESTERLY ALONG THE NORTHERLY SIDE OF WEST 5TH STREET, SOUTH 78 DEGREES 51 MINUTES 08 SECONDS WEST, 105.10 FEET TO THE POINT OR PLACE OF BEGINNING.

CONTAINING 13,160 SQUARE FEET OR 0.3021 ACRES MORE OR LESS.

BEING THE SAME PROPERTY DESCRIBED IN DEED FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050-PAGE 269; BEING PART OF PARCEL 19.



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

REVISION

USE .1 SIZE TEXT ONLY

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 47080172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 26 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES PART OF THE TAX LOT KNOWN AS SECTION 169.30–BLOCK 3064–LOT 26 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION SIGNATURES

REV	

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
#69 WEST 5TH STREET
NEW YORK STATE
10550

Date	Job Number		Rev
8/29/13	C125.09	PHONE (914)–773–1701 FAX (914)–773–1706	

DWG. NO. 00–0000–0

conEdison

DWG. TYPE: SURVEY
DWG. SIZE: C

LOCATION: #69 WEST 5TH STREET

SHEET–1 OF 1

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN

SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
WELSH ENGR./LAND SURVG,P.C.

DRAWN BY: J.H. DATE: 8–29–2013

SCALE: 1"= 20' DISCIPLINE CODE: SU

PARCEL DESCRIPTION

Dated: March 25, 2014

Section 169.38, Block 3058, Lot 1 on the current Official Tax Map of the City of Mount Vernon County of Westchester.

Parcel #4- Deed Restriction Area

ALL THAT CERTAIN PARCEL OF LAND SITUATE IN THE CITY OF MOUNT VERNON, COUNTY OF WESTCHESTER, AND STATE OF NEW YORK, BEING BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A CONCRETE MONUMENT FOUND AT THE INTERSECTION OF THE SOUTHERLY SIDE OF WEST 5TH STREET WITH THE EASTERLY SIDE OF SOUTH 9TH AVENUE AS SHOWN ON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144; THENCE EASTERLY ALONG THE SOUTHERLY SIDE OF WEST 5TH STREET, NORTH 78 DEGREES 51 MINUTES 08 SECONDS EAST, 139.71 FEET;

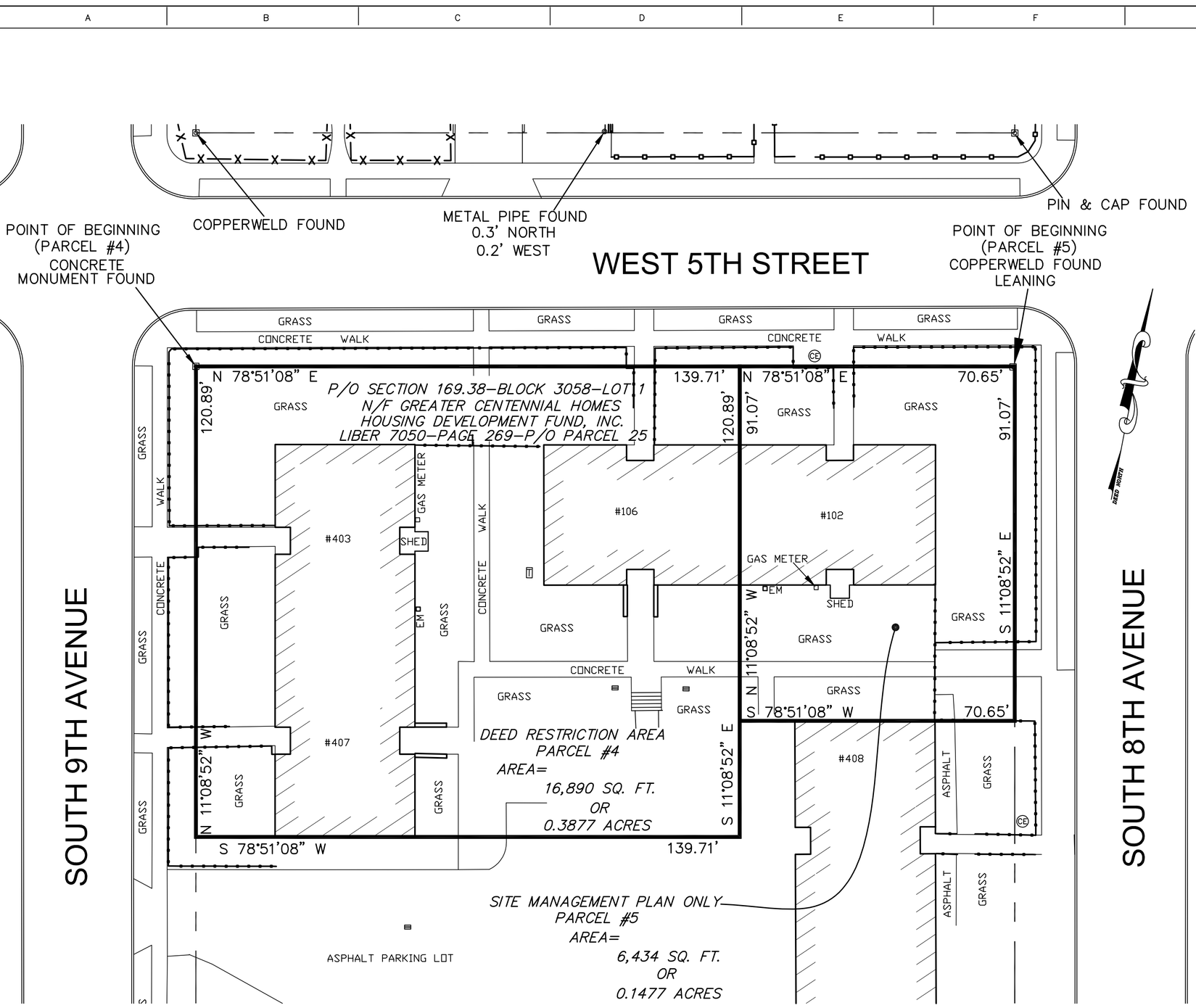
THENCE SOUTHERLY ALONG THE EASTERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 11 DEGREES 08 MINUTES 52 SECONDS EAST, 120.89 FEET;

THENCE WESTERLY ALONG THE SOUTHERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 78 DEGREES 51 MINUTES 08 SECONDS WEST, 139.71 FEET TO THE EASTERLY SIDE OF SOUTH 9TH AVENUE;

THENCE NORTHERLY ALONG THE EASTERLY SIDE OF SOUTH 9TH AVENUE, NORTH 11 DEGREES 08 MINUTES 52 SECONDS WEST, 120.89 FEET TO THE POINT OR PLACE OF BEGINNING.

CONTAINING 16,890 SQUARE FEET OR 0.3877 ACRES MORE OR LESS.

BEING THE SAME PROPERTY DESCRIBED IN DEED FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050-PAGE 269; BEING PART OF PARCEL 25.



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 1 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES PART OF THE TAX LOT KNOWN AS SECTION 169.38–BLOCK 3078–LOT 1 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
WEST 5TH STREET
NEW YORK STATE
10550

Date	Job. Number		Rev
8/29/13	C125.09	PHONE (914)–773–1701 FAX (914)–773–1706	

DWG. NO. 00–0000–0

conEdison

DWG. TYPE SURVEY
DWG. SIZE C

LOCATION: WEST 5TH STREET

SHEET–1 OF 1

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN

SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
WELSH ENGR./LAND SURVG,P.C.

DRAWN BY: J.H. DATE: 8–29–2013

SCALE: 1"= 20' DISCIPLINE CODE: SU

PARCEL DESCRIPTION

Dated: March 25, 2014

Section 169.38, Block 3058, Lot 1 on the current Official Tax Map of the City of Mount Vernon County of Westchester.

Parcel #5- Site Management Plan Only

ALL THAT CERTAIN PARCEL OF LAND SITUATE IN THE CITY OF MOUNT VERNON, COUNTY OF WESTCHESTER, AND STATE OF NEW YORK, BEING BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A COPPERWELD FOUND LEANING AT THE INTERSECTION OF THE SOUTHERLY SIDE OF WEST 5TH STREET WITH THE WESTERLY SIDE OF SOUTH 8TH AVENUE AS SHOWN ON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144; THENCE SOUTHERLY ALONG THE WESTERLY SIDE OF SOUTH 8TH AVENUE, SOUTH 11 DEGREES 08 MINUTES 52 SECONDS EAST, 91.07 FEET;

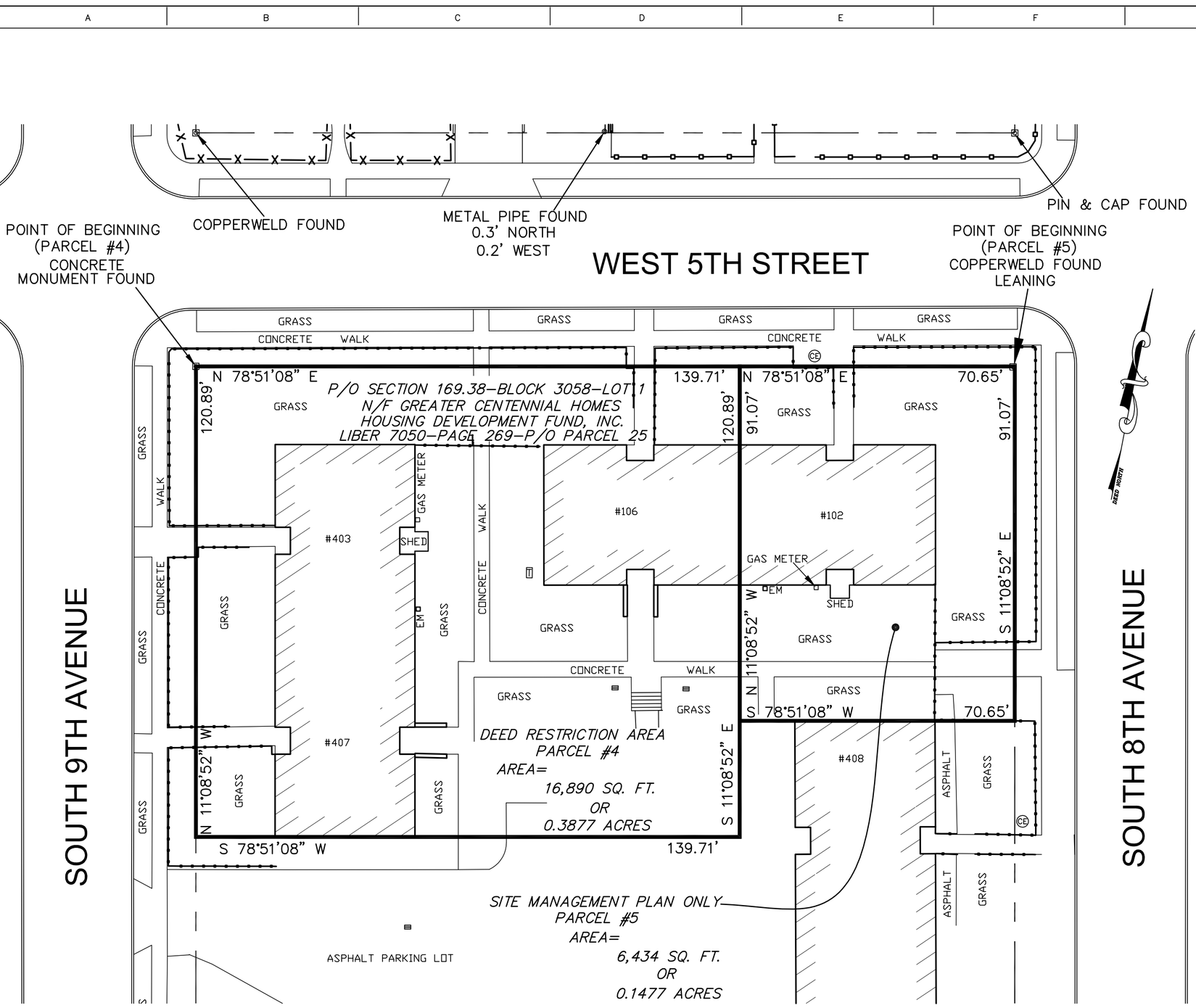
THENCE WESTERLY ALONG THE SOUTHERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 78 DEGREES 51 MINUTES 08 SECONDS WEST, 70.65 FEET;

THENCE NORTHERLY ALONG THE WESTERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, NORTH 11 DEGREES 08 MINUTES 52 SECONDS WEST, 91.07 FEET TO THE SOUTHERLY SIDE OF WEST 5TH STREET;

THENCE EASTERLY ALONG THE SOUTHERLY SIDE OF WEST 5TH STREET, NORTH 78 DEGREES 51 MINUTES 08 SECONDS EAST, 70.65 FEET TO THE POINT OR PLACE OF BEGINNING.

CONTAINING 6,434 SQUARE FEET OR 0.1477 ACRES MORE OR LESS.

BEING THE SAME PROPERTY DESCRIBED IN DEED FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050-PAGE 269; BEING PART OF PARCEL 25.



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 1 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES PART OF THE TAX LOT KNOWN AS SECTION 169.38–BLOCK 3078–LOT 1 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
WEST 5TH STREET
NEW YORK STATE
10550

Date	Job. Number		Rev
8/29/13	C125.09	PHONE (914)–773–1701 FAX (914)–773–1706	

DWG. NO. 00–0000–0

conEdison

DWG. TYPE SURVEY
DWG. SIZE C

LOCATION: WEST 5TH STREET

SHEET–1 OF 1

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN

SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
WELSH ENGR./LAND SURVG,P.C.

DRAWN BY: J.H. DATE: 8–29–2013

SCALE: 1"= 20' DISCIPLINE CODE: SU

PARCEL DESCRIPTION

Dated: March 25, 2014

Section 169.38, Block 3063, Lot 1 on the current Official Tax Map of the City of Mount Vernon County of Westchester.

Parcel #6- Site Management Plan Only

ALL THAT CERTAIN PARCEL OF LAND SITUATE IN THE CITY OF MOUNT VERNON, COUNTY OF WESTCHESTER, AND STATE OF NEW YORK, BEING BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A DISK FOUND AT THE INTERSECTION OF THE SOUTHERLY SIDE OF WEST 5TH STREET WITH THE EASTERLY SIDE OF SOUTH 8TH AVENUE AS SHOWN ON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144; THENCE EASTERLY ALONG THE SOUTHERLY SIDE OF WEST 5TH STREET, NORTH 78 DEGREES 51 MINUTES 08 SECONDS EAST, 105.00 FEET;

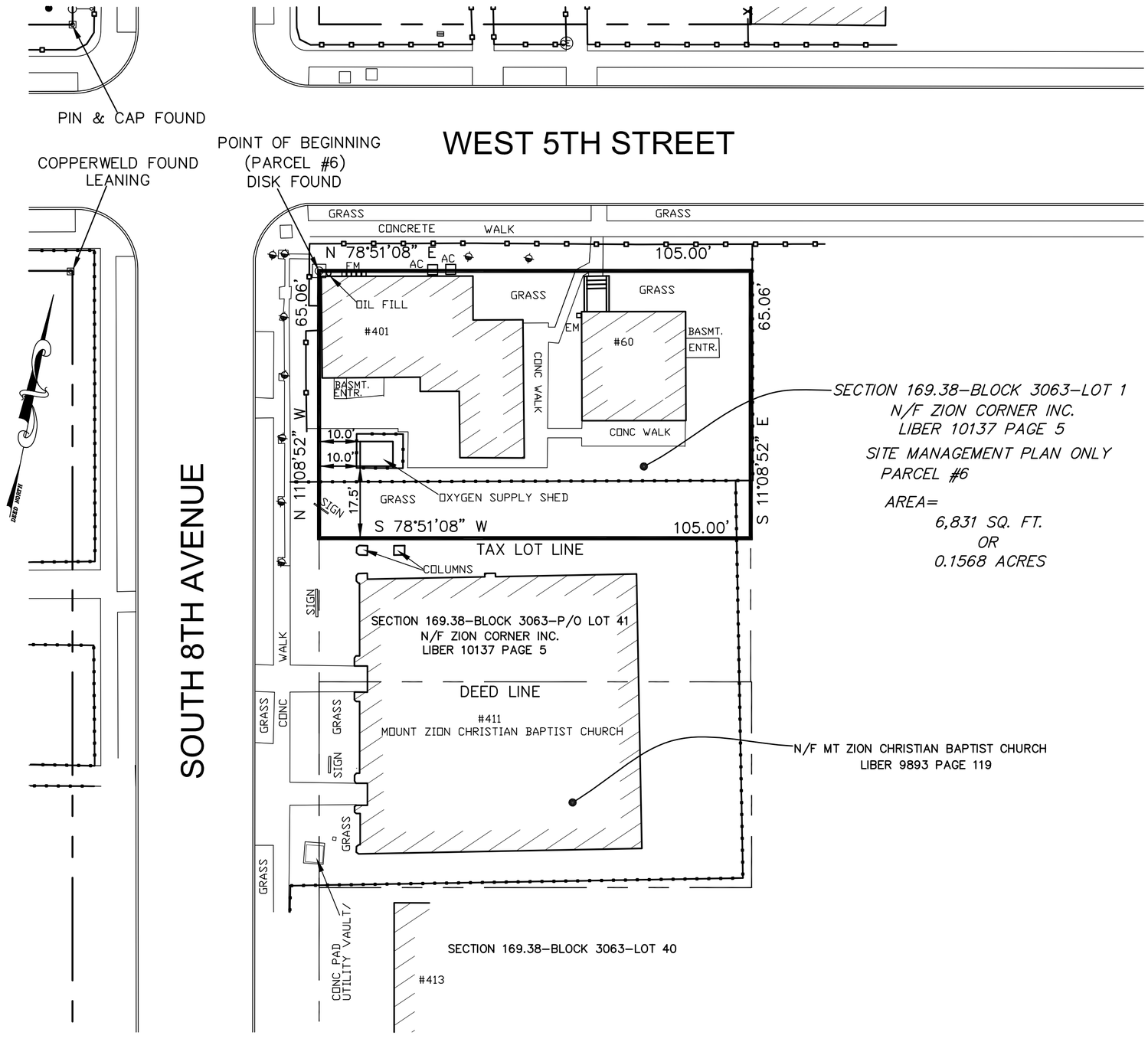
THENCE SOUTHERLY ALONG THE EASTERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 11 DEGREES 08 MINUTES 52 SECONDS EAST, 65.06 FEET;

THENCE WESTERLY ALONG THE SOUTHERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 78 DEGREES 51 MINUTES 08 SECONDS WEST, 105.00 FEET TO THE EASTERLY SIDE OF SOUTH 8TH AVENUE;

THENCE NORTHERLY ALONG THE EASTERLY SIDE OF SOUTH 8TH AVENUE, NORTH 11 DEGREES 08 MINUTES 52 SECONDS WEST, 65.06 FEET TO THE POINT OR PLACE OF BEGINNING.

CONTAINING 6,831 SQUARE FEET OR 0.1568 ACRES MORE OR LESS.

BEING PART OF THE SAME PROPERTY DESCRIBED IN DEED FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 10137-PAGE 5.



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

REVISION
USE .1 SIZE TEXT ONLY

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 26 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES THE ENTIRE TAX LOT KNOWN AS SECTION 169.38-BLOCK 3063-LOT 41 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION SIGNATURES

REV	

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
#401 SOUTH 8TH AVENUE
NEW YORK STATE
10550

Date	Job Number		Rev
8/29/13	C125.09	PHONE (914)-773-1701 FAX (914)-773-1706	

DWG. NO. 00-0000-0

conEdison

DWG. TYPE SURVEY
DWG. SIZE C

LOCATION: #401 SOUTH 8TH AVENUE

SHEET-1 OF 1

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN
SURVEY SUPERVISOR: J. CARPENTER
SURVEYOR: JOHN GERD HEIDECKER., L.S. WELSH ENGR./LAND SURVG,P.C.
DRAWN BY: J.H. DATE: 8-29-2013
SCALE: 1"= 20' DISCIPLINE CODE: SU

PARCEL DESCRIPTION

Dated: March 25, 2014

Section 169.38, Block 3063, Lot 41 on the current Official Tax Map of the City of Mount Vernon County of Westchester.

Parcel #7- Site Management Plan Only

ALL THAT CERTAIN PARCEL OF LAND SITUATE IN THE CITY OF MOUNT VERNON, COUNTY OF WESTCHESTER, AND STATE OF NEW YORK, BEING BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE EASTERLY SIDE OF SOUTH 8TH AVENUE, SAID POINT BEING DISTANT 65.06 FEET SOUTHERLY FROM A DISK FOUND AT THE INTERSECTION OF THE SOUTHERLY SIDE OF WEST 5TH STREET WITH THE EASTERLY SIDE OF SOUTH 8TH AVENUE AS SHOWN ON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144; THENCE EASTERLY ALONG THE NORTHERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, NORTH 78 DEGREES 51 MINUTES 08 SECONDS EAST, 105.00 FEET;

THENCE SOUTHERLY ALONG THE EASTERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 11 DEGREES 08 MINUTES 52 SECONDS EAST, 34.94 FEET;

THENCE EASTERLY, NORTH 78 DEGREES 51 MINUTES 08 SECONDS EAST, 0.22 FEET;

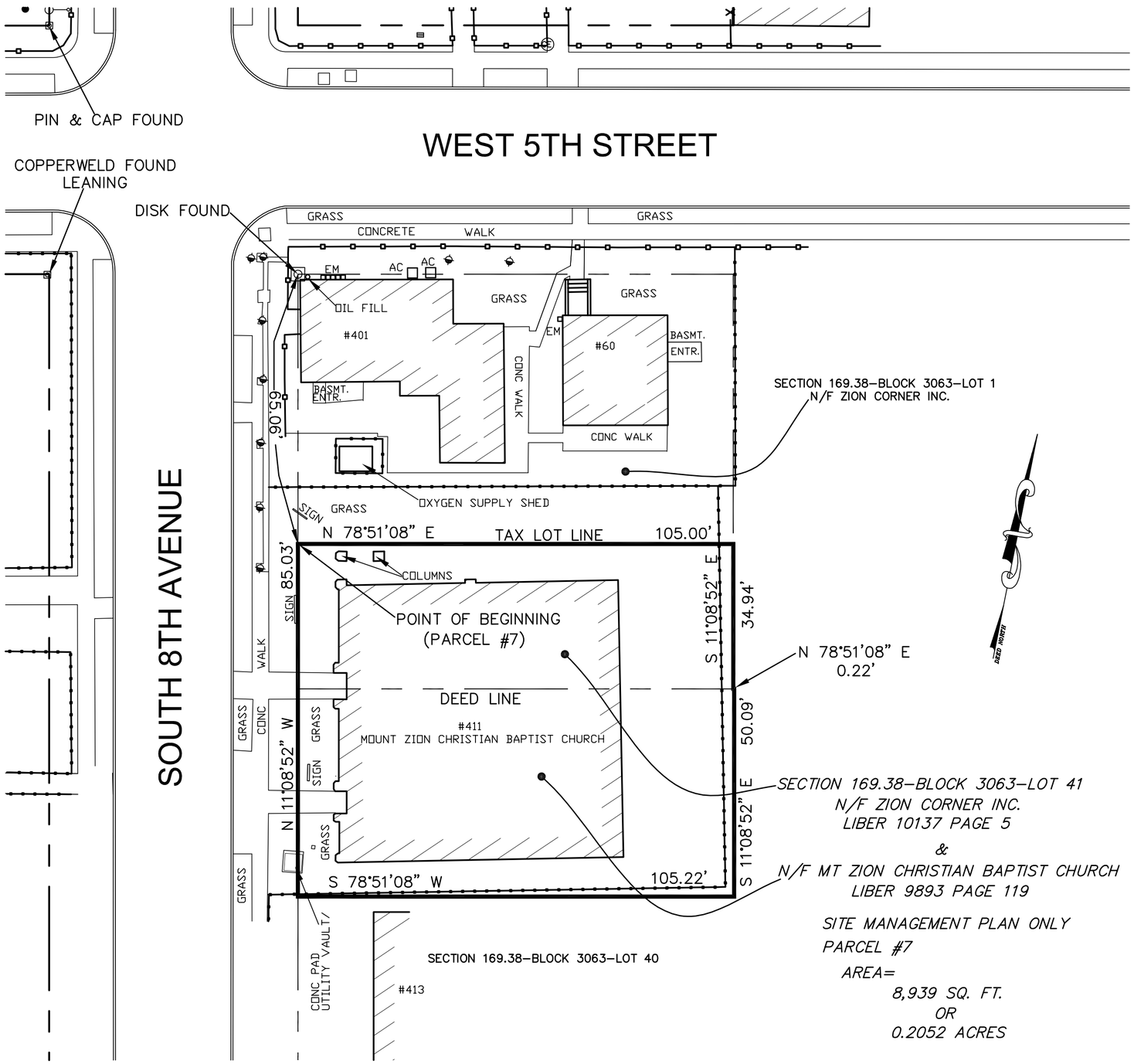
THENCE SOUTHERLY CONTINUING ALONG THE EASTERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 11 DEGREES 08 MINUTES 52 SECONDS EAST, 50.09 FEET;

THENCE WESTERLY ALONG THE SOUTHERLY LIMIT OF THE PARCEL HEREIN DESCRIBED, SOUTH 78 DEGREES 51 MINUTES 08 SECONDS WEST, 105.22 FEET TO THE EASTERLY SIDE OF SOUTH 8TH AVENUE;

THENCE NORTHERLY ALONG THE EASTERLY SIDE OF SOUTH 8TH AVENUE, NORTH 11 DEGREES 08 MINUTES 52 SECONDS WEST, 85.03 FEET TO THE POINT OR PLACE OF BEGINNING.

CONTAINING 8,939 SQUARE FEET OR 0.2052 ACRES MORE OR LESS.

BEING PART OF THE SAME PROPERTY DESCRIBED IN DEED FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 10137-PAGE 5 AND BEING THE SAME PROPERTY DESCRIBED IN DEED FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 9893-PAGE 119.



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

REVISION
USE .1 SIZE TEXT ONLY

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 26 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES THE ENTIRE TAX LOT KNOWN AS SECTION 169.38–BLOCK 3063–LOT 41 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION SIGNATURES

REV	

DWG. NO. 00–0000–0

conEdison

DWG. TYPE SURVEY

DWG. SIZE C

LOCATION: #401 SOUTH 8TH AVENUE

SHEET-1 OF 1

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

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SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
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Appendix B

Responsibilities of Owner and Remedial Party

APPENDIX B

RESPONSIBILITIES of

OWNERS and REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan ("SMP") for the Controlled Properties of the Mount Vernon Former Manufactured Gas Plant Site ("Site"), Site # V00569, are divided between the owner(s) of the Controlled Properties and Con Edison, as the Remedial Party for the Site under NYSDEC Voluntary Cleanup Agreement Index #D2-0003-02-08 (the "VCA"), as defined below. The current owner(s) of the Controlled Properties are as follows:

Greater Centennial Homes HDFC
Contact Name: W. Darin Moore,
Address: 130 West 5th Street, Mount Vernon, NY 10550
Telephone: (TBD)

Mount Zion Christian Baptist Church
Contact Name: Rev. Peter Wilson, Senior
Address: 411 South 8th Street, Mount Vernon, NY 10550
Telephone: (TBD)

359 South 9th Avenue LLC
Contact Name: Mark Spitz
Address: 2 Gramatan Avenue, Mount Vernon, NY 10550
Telephone: (TBD)

Solely for the purposes of this document and based upon the facts related to a particular site and the remedial program being carried out, the term Remedial Party ("RP") refers to any of the following: certificate of completion holder, volunteer, applicant, responsible party, and, in the event the NYSDEC is carrying out remediation or site management, the NYSDEC and/or an agent acting on its behalf.

The RP for the Controlled Properties of the Site is:

Con Edison:
Contact Name: Horace Davis, Director of Remediation Group – EH&S Department
Address: 31-01 20th Avenue, Astoria, New York 11105
Telephone: (718) 204-4145

Nothing on this page shall supersede the provisions of the Deed Restrictions that are applicable to the Controlled Properties of the Site and that affects rights and obligations relating to the Site.

Controlled Property Owner's Responsibilities:

1) The Controlled Property owner shall follow the provisions of the SMP as they relate to future construction and excavation at the owner's Controlled Property.

2) In accordance with a periodic time frame determined by the NYSDEC, the Controlled Property owner shall periodically certify, in writing, that all Institutional Controls set forth in a Deed Restriction applicable to the owner's Controlled Property, remain in place and continue to be complied with. The Controlled Property owner shall provide a written certification to Con Edison, in order to allow Con Edison, as the RP for the Site under the VCA, to include the certification in the Site's Annual Review Report (ARR) certification to the NYSDEC.

3) In the event the Site is delisted, the Controlled Property owner remains bound by the Deed Restriction applicable to the owner's Controlled Property and shall submit, upon request by the NYSDEC, a written certification that the Deed Restriction is still in place and has been complied with.

4) The Controlled Property owner shall grant access to the owner's Controlled Property to Con Edison and the NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

5) In the event some action or inaction by the owner adversely impacts the Site, the owner must notify the site's RP and the NYSDEC in accordance with the time frame indicated in [Section 2.4.2]- Notifications and (ii) coordinate the performance of necessary corrective actions with the RP.

6) The Controlled Property owner must notify Con Edison and the NYSDEC of any change in ownership of the owner's Controlled Property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the Controlled Property/ies. 6 NYCRR Part 375 contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: Sixty days prior written notification must be made to the NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 2.4.2 of the SMP for the Mount Vernon Former Manufactured Gas Plant Site. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

Remedial Party Responsibilities

1) The RP must follow the SMP provisions regarding any construction and/or excavation it undertakes at any Controlled Property of the Site.

2) On receipt of notification from a Controlled Property owner for ground intrusive work that will entail the excavation/disturbance of subsurface soils below the depths specified in Figure 2-

4 of the SMP for the Mount Vernon Former Manufactured Gas Plant Site, Con Edison in consultation with NYSDEC will make a determination if the special measures of the SMP's Excavation Work Plan may be required for the work.

3) Con Edison shall report to the NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, annual review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.

3) Before accessing any Controlled Property of the Site to undertake a specific activity, Con Edison shall provide the owner of the Controlled Property advance notification that shall include an explanation of the work expected to be completed. Con Edison shall provide to (i) the Controlled Property owner, (ii) the NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during Con Edison's work on the owner's Controlled Property and/or any final report produced for the owner's Controlled Property.

4) If the NYSDEC determines that an update of the SMP is necessary, Con Edison shall update the SMP and obtain final approval from the NYSDEC. Within 5 business days after NYSDEC approval, Con Edison shall submit a copy of the approved SMP to the owner(s) of the Controlled Properties of the Site.

5) Con Edison shall notify the NYSDEC and the owner(s) of the Controlled Properties of the Site of any changes in the ownership and/or control of Con Edison and of any changes in the party/entity responsible for the operation, maintenance, and monitoring of and reporting with respect to any remedial system (Engineering Controls) required for the Controlled Properties. Con Edison shall provide contact information for the new party/entity. Such activity constitutes a Change of Use pursuant to 375-1.11(d) and requires 60-days prior notice to the NYSDEC. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/ chemical/76250.html.

6) Con Edison shall notify the NYSDEC of any damage to or modification of the required remedial systems for the Controlled Properties of the Site, as required under Section 2.4.2 - Notifications of the SMP.

7) Prior to a change in use that impacts the remedial system or requirements applicable to a Controlled Property and/or the responsibilities for implementing the SMP for the Controlled Properties of the Site, Con Edison shall submit to the NYSDEC for approval an amended SMP.

8) Any change in use, change in ownership, change in site classification (*e.g.*, delisting), reduction or expansion of remediation, and other significant changes related to the Controlled Properties of the Site may result in a change in responsibilities and, therefore, necessitate an update to the SMP and/or updated legal documents. Con Edison shall contact the Department to discuss the need to update such documents.

Change in the ownership and/or control of Con Edison and/or the ownership of the Controlled Properties of the Site does not affect Con Edison's obligations under the VCA with respect to the Controlled Properties of the Site unless a legally binding document executed by the NYSDEC releases Con Edison of its obligations.

Future Controlled Property owners and RPs and their successors and assigns are required to carry out the activities set forth above.

Appendix C

Declaration of Covenants and Restrictions

DECLARATION of COVENANTS and RESTRICTIONS

THIS DECLARATION of COVENANTS and RESTRICTIONS is made the _____ day of _____ 2014, by **GREATER CENTENNIAL HOMES HOUSING DEVELOPMENT FUND COMPANY, INC.**, a corporation organized and existing under the laws of the State of New York and having an office for the transaction of business at 103 West Fifth Street, Mount Vernon, New York 10550 .

WHEREAS, Greater Centennial Homes Housing Development Fund Company, Inc. is the fee owner of certain parcels of real property that are participating in the Voluntary Cleanup Program of the New York State Department of Environmental Conservation (the "**Department**" having an office at 625 Broadway, Albany, New York 12233) as part of the Mount Vernon Former Manufactured Gas Plant Site (Site #V00569), namely those parcels of real property located at 103 West Fifth Street, 106 West Fifth Street, 342 South Eighth Avenue, 346 South Eighth Avenue, 350 South Eighth Avenue, 403 South Ninth Avenue, and 407 South Ninth Avenue, in the City of Mount Vernon, County of Westchester, State of New York, being the same as (or part of) that property conveyed to Greater Centennial Homes Housing Development Fund Company, Inc. by the Mount Vernon Urban Renewal Agency by deed(s) dated April 11, 1972, and recorded on April 13, 1972, in the Westchester County Clerk's Office in Liber 7050, pages 269 through 290 of Deeds, and being more particularly described in Schedule "A," attached to this Declaration of Covenants and Restrictions and made a part hereof, and hereinafter referred to as "**the Property**"; and

WHEREAS, the Property, together with the other lands comprising the Mount Vernon Former Manufactured Gas Plant Site, are the subject of Voluntary Cleanup Agreement Index #D2-0003-02-08 (the "**VCA**") executed by the Department and Consolidated Edison Company of New York, Inc. ("**Con Edison**"); and

WHEREAS, the Department approved a Remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed of at the Property and such Remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, Greater Centennial Homes Housing Development Fund Company, Inc., for itself and its successors and/or assigns, covenants that:

FIRST, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Schedule "B" and made a part hereof.

SECOND, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan ("SMP"), there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human

exposure to contaminated soils. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233.

THIRD, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition by the Department or Relevant Agency.

FOURTH, the owner of the Property shall prohibit the Property from ever being used for purposes other than "Restricted Residential" use as described in 6 NYCRR Part 375-1.8(g)(2)(ii), "Commercial" use as described in 6 NYCRR Part 375-1.8(g)(2)(iii), and/or "Industrial" use as described in 6 NYCRR Part 375-1.8(g)(2)(iv) without the express written waiver of such prohibition by the Department or Relevant Agency.

FIFTH, the use of the groundwater underlying the Property is prohibited without necessary water quality treatment as determined by the New York State Department of Health or the Westchester County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.

SIXTH, as the remedial party under the VCA, Con Edison shall be responsible for providing, and the Department shall in the first instance look to Con Edison to provide, a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired. Notwithstanding the foregoing, if Con Edison fails to provide the required periodic certification for the Property, the Department or Relevant Agency reserves the right to notify the owner of the Property in writing, and require the owner to provide the Department or Relevant Agency with the required periodic certification

SEVENTH, the owner of the Property shall continue in full force and effect any institutional controls required for the Remedy and maintain such institutional controls, unless the owner of the Property or Con Edison first obtains permission to discontinue such institutional controls from the Department or Relevant Agency, in compliance with the SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency.

EIGHTH, as the remedial party under the VCA, Con Edison shall continue, and the Department will in the first instance look to Con Edison to continue, in full force and effect any engineering controls required for the Remedy, and to maintain such engineering controls in compliance with the SMP, unless Con Edison or the owner of the Property first obtains permission to discontinue such engineering controls from the Department or Relevant Agency. Notwithstanding the foregoing, however, if Con Edison fails to comply with such obligation, the Department or Relevant Agency will notify the owner of the Property in writing, and the owner of the Property shall continue in full force and effect and maintain any such required engineering controls in compliance with the SMP and any modifications thereto approved by the Department

or Relevant Agency, until such time as the Department or Relevant Agency grants permission to the owner of the Property to discontinue such required engineering controls.

NINTH, this Declaration of Covenants and Restriction is and shall be deemed a covenant that shall run with the land and shall be biding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Voluntary Cleanup Agreement requires be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

TENTH, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

GREATER CENTENNIAL HOMES HOUSING DEVELOPMENT FUND COMPANY, INC.

By: _____

Print Name: _____

Title: _____

Date: _____

Grantor's Acknowledgment

STATE OF NEW YORK)
) s.s. :
COUNTY OF WESTCHESTER)

On the _____ day of _____, in the year 2014, before me, the undersigned, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____

Notary Public State of New York

SCHEDULE A

METES AND BOUNDS DESCRIPTION
THE PROPERTY

PARCEL 1

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, situate, lying and being in the City of Mount Vernon, County of Westchester and State of New York, and more particularly being bounded and described as follows:

BEGINNING at a pin and cap found at the intersection of the northerly side of West 5th Street with the westerly side of side of South 8th Avenue as shown on the map filed with the Westchester County Clerk as Map # 144;

THENCE westerly along the northerly side of West 5th Street, South 78 degrees 51 minutes 08 seconds West, 105.22 feet;

THENCE northerly along the westerly limit of the parcel herein described, North 11 degrees 08 minutes 52 seconds West, 300.64 feet;

THENCE easterly along the northerly limit of the parcel herein described, North 78 degrees 51 minutes 08 seconds EAST, 105.22 feet to the westerly side of South 8th Avenue;

THENCE southerly along the westerly side of South 8th Avenue, South 11 degrees 08 minutes 52 seconds East, 300.64 feet to the point or place of the **BEGINNING**.

Containing 31,633 square feet or 1.2088 acres more or less.

Being the same as the property described in the Deed filed with the Westchester County Clerk as Liber 7050, Page 269, being part of parcel 14.

PARCEL 2

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, situate, lying and being in the City of Mount Vernon, County of Westchester and State of New York, and more particularly being bounded and described as follows:

BEGINNING at a concrete monument found at the intersection of the southerly side of West 5th Street with the easterly side of South 9th Avenue as shown on the map filed with the Westchester County Clerk as Map #144;

THENCE easterly along the southerly side of West 5th Street, North 78 degrees 51 minutes 08 seconds East, 139.71 feet;

THENCE southerly along the easterly limit of the parcel herein described, South 11 degrees 08 minutes 52 seconds East, 120.89 feet;

THENCE westerly along the southerly limit of the parcel herein described, South 78 degrees 51 minutes 08 seconds West,139.71 feet to the easterly side of South 9th Avenue;

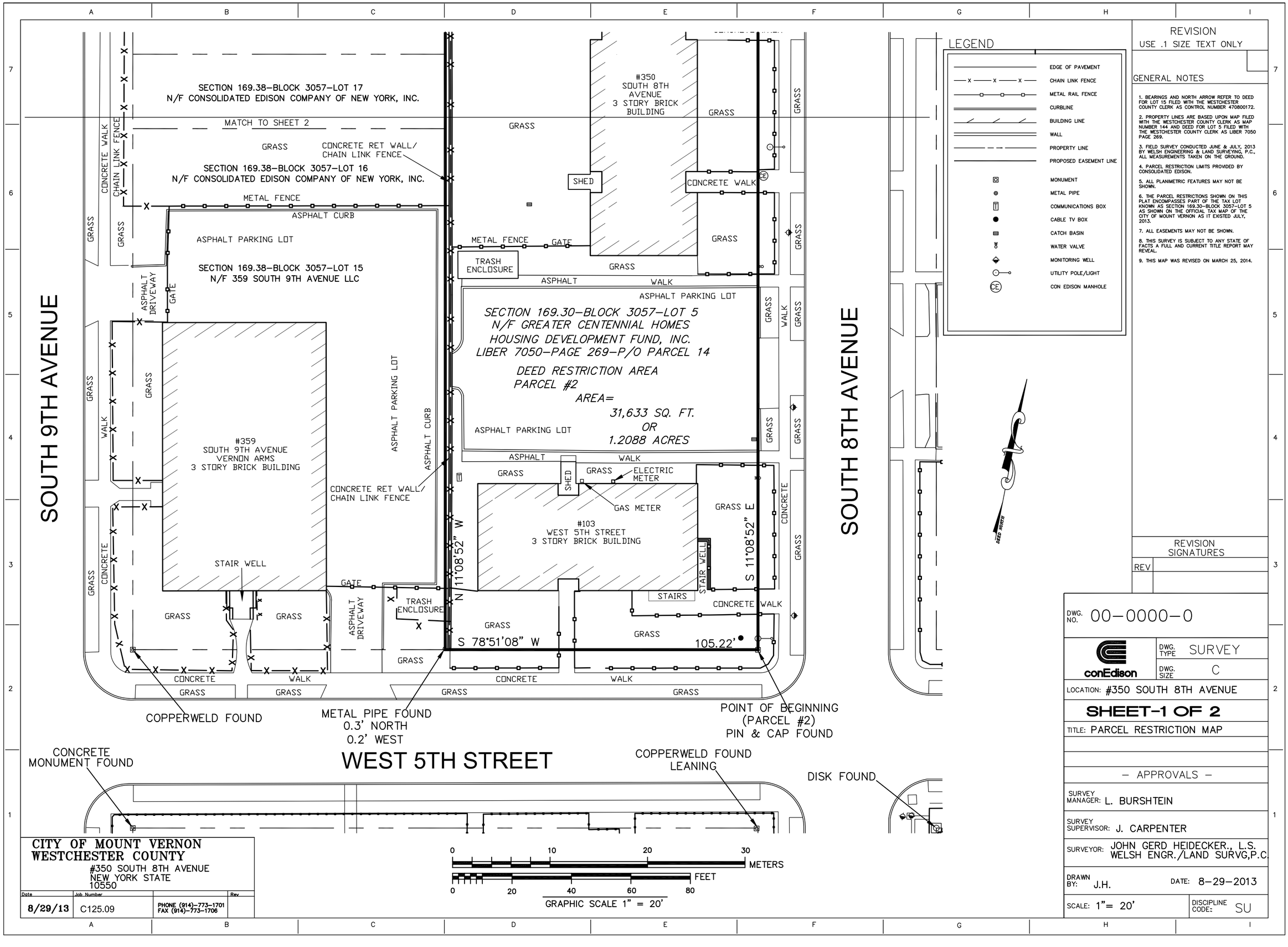
THENCE northerly along the easterly side of South 9th Avenue, North 11 degrees 08 minutes 52 seconds West, 120.89 feet to the point or place of the **BEGINNING**.

Containing 16,890 square feet or 0.3877 acres more or less.

Being the same as the property described in the Deed filed with the Westchester County Clerk as Liber 269, Page 269, being part of Parcel 25.

SCHEDULE B

MAPS OF THE PROPERTY



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
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- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
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- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

DEED NORTH

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

REVISION

USE .1 SIZE TEXT ONLY

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 5 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES PART OF THE TAX LOT KNOWN AS SECTION 169.30–BLOCK 3057–LOT 5 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION SIGNATURES

REV

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DWG. TYPE: SURVEY
DWG. SIZE: C

LOCATION: #350 SOUTH 8TH AVENUE

SHEET–1 OF 2

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN

SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
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DRAWN BY: J.H. DATE: 8–29–2013

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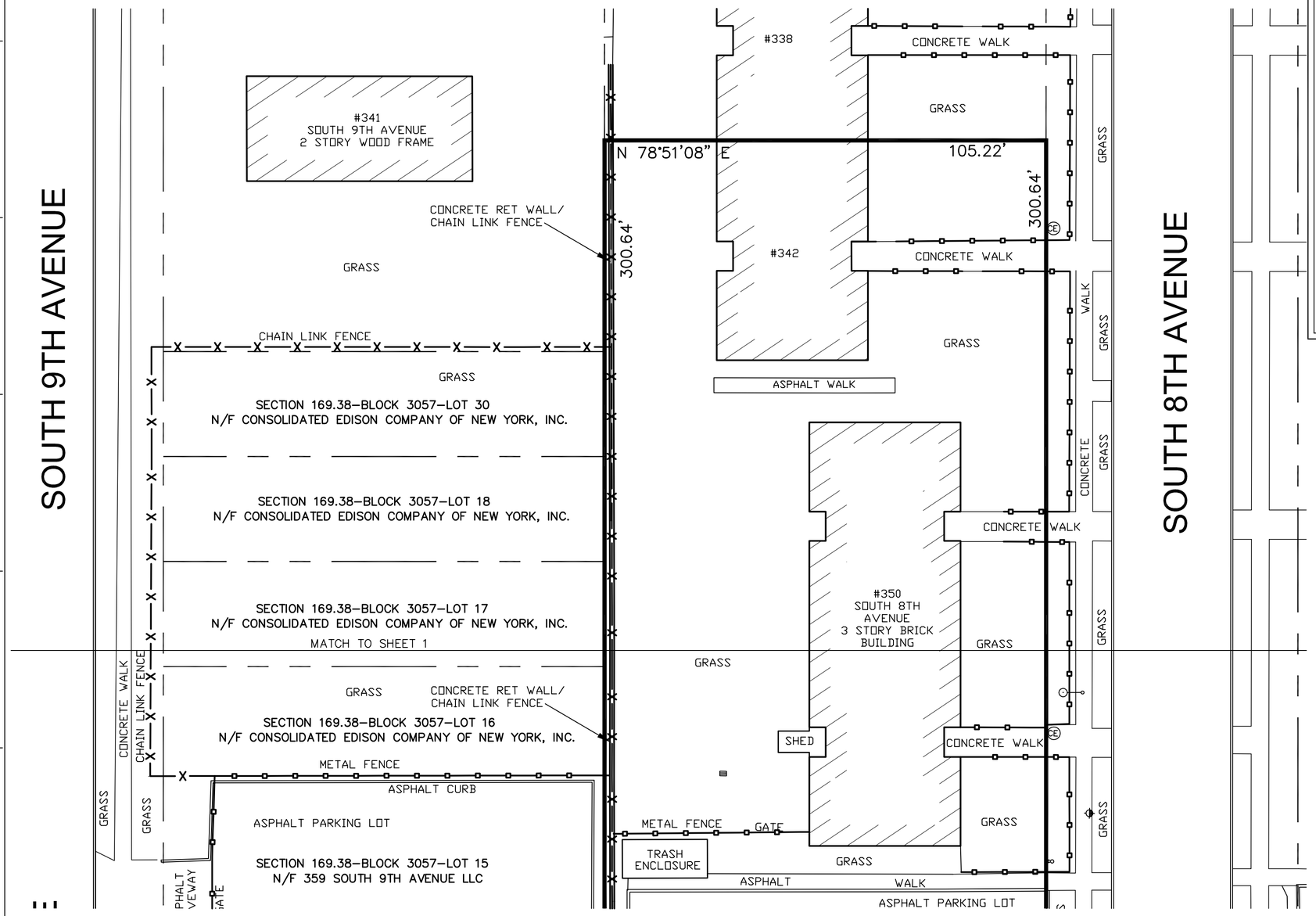

LEGEND

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GRID NORTH

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REVISION
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REVISION SIGNATURES

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0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

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DWG. NO. 00–0000–0

conEdison

DWG. TYPE SURVEY
DWG. SIZE C

LOCATION: #350 SOUTH 8TH AVENUE

SHEET–2 OF 2

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN

SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
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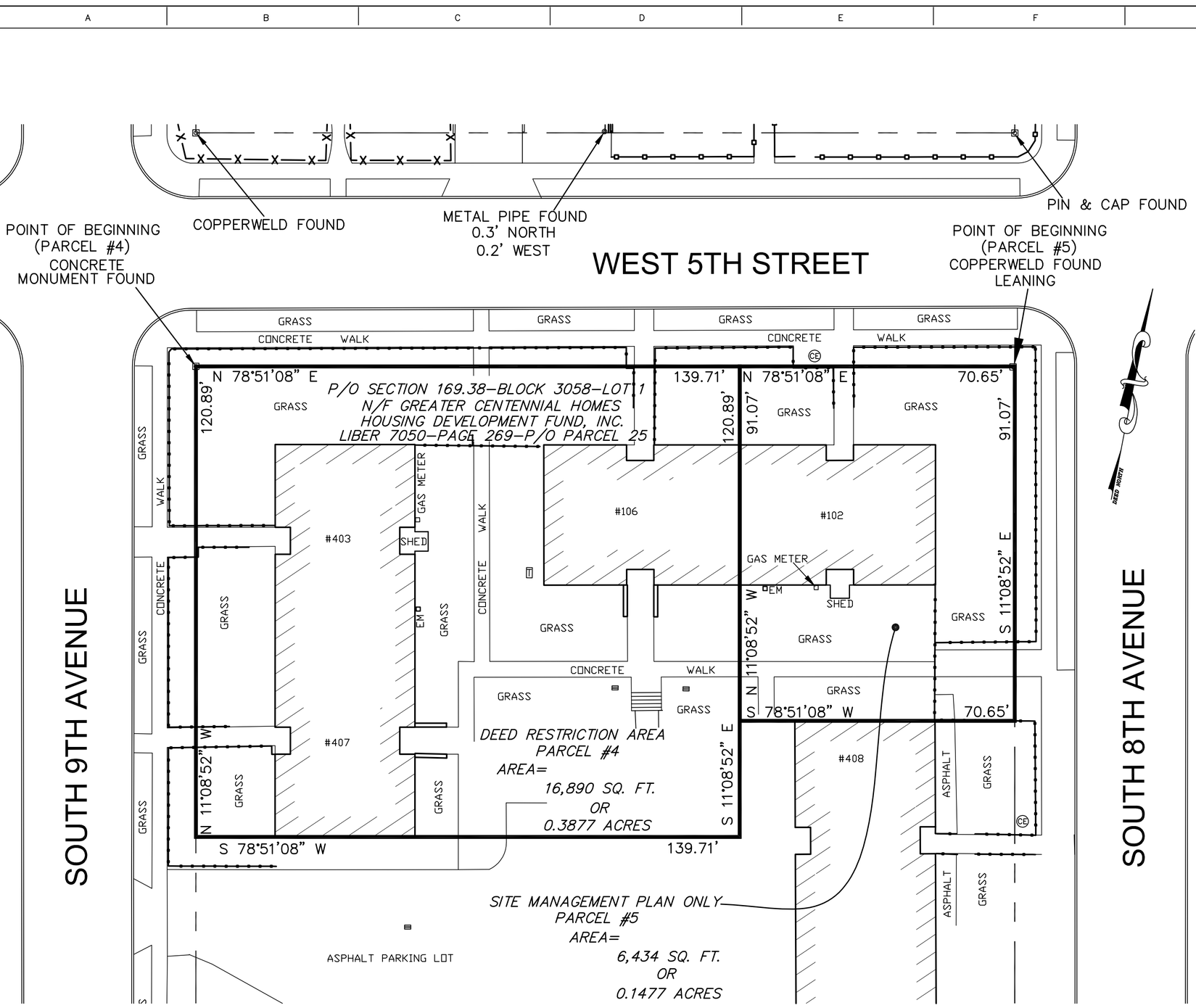

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- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 1 FILED WITH THE WESTCHESTER COUNTY CLERK AS LIBER 7050 PAGE 269.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES PART OF THE TAX LOT KNOWN AS SECTION 169.38–BLOCK 3078–LOT 1 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION
USE .1 SIZE TEXT ONLY

REVISION SIGNATURES

REV	

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
WEST 5TH STREET
NEW YORK STATE
10550

Date	Job. Number		Rev
8/29/13	C125.09	PHONE (914)–773–1701 FAX (914)–773–1706	

DWG. NO. 00–0000–0

conEdison

DWG. TYPE SURVEY
DWG. SIZE C

LOCATION: WEST 5TH STREET

SHEET–1 OF 1

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN

SURVEY SUPERVISOR: J. CARPENTER

SURVEYOR: JOHN GERD HEIDECKER., L.S.
WELSH ENGR./LAND SURVG,P.C.

DRAWN BY: J.H. DATE: 8–29–2013

SCALE: 1"= 20' DISCIPLINE CODE: SU

DECLARATION of COVENANTS and RESTRICTIONS

THIS DECLARATION of COVENANTS and RESTRICTIONS is made the ___ day of _____ 2014, by **359 SOUTH 9TH AVENUE LLC**, a limited liability company organized and existing under the laws of the State of New York and having an office for the transaction of business at 2 Gramatan Avenue, Suite 209, Mount Vernon, New York 10550.

WHEREAS, 359 South Ninth Avenue LLC is the fee owner of a parcel of real property that is participating in the Voluntary Cleanup Program of the New York State Department of Environmental Conservation (the "Department" having an office at 625 Broadway, Albany, New York 12233) as part of the Mount Vernon Former Manufactured Gas Plant Site (Site #V00569), namely that parcel of real property located at 359 South 9th Avenue in the City of Mount Vernon, County of Westchester, State of New York, being the same as (or part of) that property conveyed to 359 Vernon South 9th Avenue LLC by Vernon Arms, Inc. by deed(s) dated March 29, 2007, and recorded on March 29, 2007 in the Westchester County Clerk's Office as Instrument No. 470800172, and being more particularly described in Schedule "A," attached to this declaration and made a part hereof, and hereinafter referred to as "the Property"; and

WHEREAS, the Property, together with the other lands comprising the Mount Vernon Former Manufactured Gas Plant Site, is the subject of Voluntary Cleanup Agreement Index #D2-0003-02-08 (the "VCA") executed by the Department and Consolidated Edison Company of New York, Inc. ("Con Edison"); and

WHEREAS, the Department approved a Remedy to eliminate or mitigate all significant threats to the environment presented by the contamination disposed at the Property and such Remedy requires that the Property be subject to restrictive covenants.

NOW, THEREFORE, 359 South 9th Avenue LLC, for itself and its successors and/or assigns, covenants that:

FIRST, the Property subject to this Declaration of Covenants and Restrictions is as shown on a map attached to this declaration as Schedule "B" and made a part hereof.

SECOND, unless prior written approval by the Department or, if the Department shall no longer exist, any New York State agency or agencies subsequently created to protect the environment of the State and the health of the State's citizens, hereinafter referred to as "the Relevant Agency," is first obtained, where contamination remains at the Property subject to the provisions of the Site Management Plan (the "SMP"), there shall be no construction, use or occupancy of the Property that results in the disturbance or excavation of the Property which threatens the integrity of the engineering controls or which results in unacceptable human exposure to contaminated soils. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233.

THIRD, the owner of the Property shall not disturb, remove, or otherwise interfere with the installation, use, operation, and maintenance of engineering controls required for the Remedy, which are described in the SMP, unless in each instance the owner first obtains a written waiver of such prohibition from the Department or Relevant Agency.

FOURTH, the owner of the Property shall prohibit the Property from ever being used for purposes other than for Restricted Residential as described in 6 NYCRR Part 375-1.8(g)(2)(ii), Commercial as described in 6 NYCRR Part 375-1.8(g)(2)(iii) and Industrial as described in 6 NYCRR Part 375-1.8(g)(2)(iv) without the express written waiver of such prohibition by the Department or Relevant Agency.

FIFTH, the use of groundwater underlying the Property is prohibited without necessary water quality treatment as determined by the New York State Department of Health or the Westchester County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.

SIXTH, as the remedial party under the VCA, Con Edison shall be responsible and the Depart shall in the first instance look to Con Edison to provide a periodic certification, prepared and submitted by a professional engineer or environmental professional acceptable to the Department or Relevant Agency, which will certify that the institutional and engineering controls put in place are unchanged from the previous certification, comply with the SMP, and have not been impaired. Notwithstanding the foregoing, if Con Edison fails to provide the required periodic certification for the Property, the Department or Relevant Agency reserves the right to notify the owner of the Property in writing, and require the owner to provide the Department or Relevant Agency with the required periodic certification.

SEVENTH, the owner of the Property shall continue in full force and effect any institutional controls required for the Remedy and maintain such institutional controls, unless the owner of the Property or Con Edison first obtains permission to discontinue such controls from the Department or Relevant Agency, in compliance with the approved SMP, which is incorporated and made enforceable hereto, subject to modifications as approved by the Department or Relevant Agency.

EIGHTH, as the remedial party under the VCA, Con Edison shall continue, and the Department will in the first instance look to Con Edison to continue, in full force and effect any engineering controls required for the Remedy, and to maintain such engineering controls in compliance with the SMP, unless Con Edison or the owner of the Property first obtains permission to discontinue such engineering controls from the Department or Relevant Agency. Notwithstanding the foregoing, however, if Con Edison fails to comply with such obligation, the Department or Relevant Agency will notify the owner of the Property in writing, and the owner of the Property shall continue in full force and effect and maintain any such required engineering controls in compliance with the SMP and any modifications thereto approved by the Department or Relevant Agency, until such time as the Department or Relevant Agency grants permission to the owner of the Property to discontinue such required engineering controls.

NINTH, this Declaration of Covenants and Restrictions is and shall be deemed a covenant that shall run with the land and shall be binding upon all future owners of the Property, and shall provide that the owner and its successors and assigns consent to enforcement by the Department or Relevant Agency of the prohibitions and restrictions that the Voluntary Cleanup Agreement requires to be recorded, and hereby covenant not to contest the authority of the Department or Relevant Agency to seek enforcement.

TENTH, any deed of conveyance of the Property, or any portion thereof, shall recite, unless the Department or Relevant Agency has consented to the termination of such covenants and restrictions, that said conveyance is subject to this Declaration of Covenants and Restrictions.

IN WITNESS WHEREOF, the undersigned has executed this instrument the day written below.

359 SOUTH 9TH AVENUE LLC

By: _____

Print Name: _____

Title: _____

Date: _____

Grantor's Acknowledgment

STATE OF NEW YORK)
) s.s.:
COUNTY OF WESTCHESTER)

On the _____ day of _____, in the year 2014, before me, the undersigned, personally appeared _____, personally known to me or proved to me on the basis of satisfactory evidence to be the individual(s) whose name is (are) subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their capacity(ies), and that by his/her/their signature(s) on the instrument, the individual(s), or the person upon behalf of which the individual(s) acted, executed the instrument.

_____
Notary Public State of New York

SCHEDULE A

METES AND BOUNDS DESCRIPTION OF THE PROPERTY

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, situate, lying and being in the City of Mount Vernon, County of Westchester and State of New York, and more particularly being bounded and described as follows:

BEGINNING at a copperweld found at the intersection of the northerly side of West 5th Street with the easterly side of South 9th Avenue as shown on the map filed with the Westchester County Clerk as Map #144;

THENCE northerly along the easterly side of South 9th Avenue, North 11 degrees 08 minutes 52 seconds West, 150.29 feet;

THENCE easterly along the northerly limit of the parcel herein described, North 78 degrees 51 minutes 08 seconds East, 105.14 feet;

THENCE southerly along the easterly limit of the parcel described herein, South 11 degrees 08 minutes 52 seconds East,150.29 feet to the northerly side of West 5th Street;

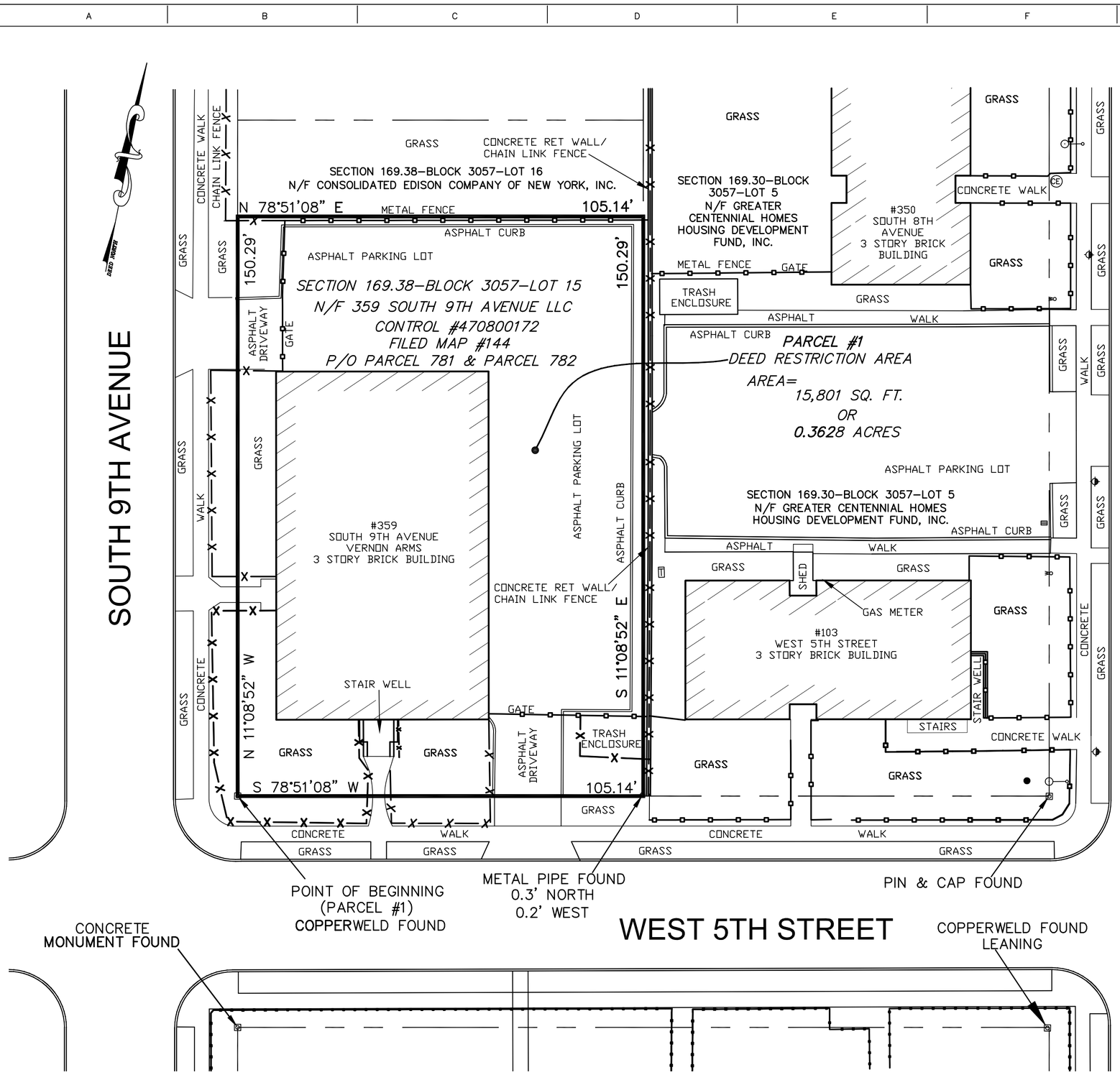
THENCE westerly along the northerly side of West 5th Street, South 78 degrees 51 minutes 08 seconds West, 105.14 feet to the point or place of the **BEGINNING**.

Containing 15,801 square feet or 0.3628 acres more or less.

Being the same as the same property described in the deed filed with the Westchester County Clerk as Control Number 470800172.

SCHEDULE B

MAP OF THE PROPERTY



LEGEND

- EDGE OF PAVEMENT
- CHAIN LINK FENCE
- METAL RAIL FENCE
- CURBLINE
- BUILDING LINE
- WALL
- PROPERTY LINE
- PROPOSED EASEMENT LINE
- MONUMENT
- METAL PIPE
- COMMUNICATIONS BOX
- CABLE TV BOX
- CATCH BASIN
- WATER VALVE
- MONITORING WELL
- UTILITY POLE/LIGHT
- CON EDISON MANHOLE
- P/O — PART OF

REVISION
USE .1 SIZE TEXT ONLY

GENERAL NOTES

1. BEARINGS AND NORTH ARROW REFER TO DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
2. PROPERTY LINES ARE BASED UPON MAP FILED WITH THE WESTCHESTER COUNTY CLERK AS MAP NUMBER 144 AND DEED FOR LOT 15 FILED WITH THE WESTCHESTER COUNTY CLERK AS CONTROL NUMBER 470800172.
3. FIELD SURVEY CONDUCTED JUNE & JULY, 2013 BY WELSH ENGINEERING & LAND SURVEYING, P.C., ALL MEASUREMENTS TAKEN ON THE GROUND.
4. PARCEL RESTRICTION LIMITS PROVIDED BY CONSOLIDATED EDISON.
5. ALL PLANIMETRIC FEATURES MAY NOT BE SHOWN.
6. THE PARCEL RESTRICTIONS SHOWN ON THIS PLAT ENCOMPASSES THE ENTIRE TAX LOT KNOWN AS SECTION 169.38–BLOCK 3057–LOT 15 AS SHOWN ON THE OFFICIAL TAX MAP OF THE CITY OF MOUNT VERNON AS IT EXISTED JULY, 2013.
7. ALL EASEMENTS MAY NOT BE SHOWN.
8. THIS SURVEY IS SUBJECT TO ANY STATE OF FACTS A FULL AND CURRENT TITLE REPORT MAY REVEAL.
9. THIS MAP WAS REVISED ON MARCH 25, 2014.

REVISION SIGNATURES

REV	

CITY OF MOUNT VERNON
WESTCHESTER COUNTY
#359 SOUTH 9TH AVENUE
NEW YORK STATE
10550

Date	Job Number		Rev
8/29/13	C125.09	PHONE (914)–773–1701 FAX (914)–773–1706	

0 10 20 30 METERS
0 20 40 60 80 FEET
GRAPHIC SCALE 1" = 20'

DWG. NO. 00–0000–0

conEdison

DWG. TYPE SURVEY
DWG. SIZE C

LOCATION: #359 SOUTH 9TH AVENUE

SHEET–1 OF 1

TITLE: PARCEL RESTRICTION MAP

– APPROVALS –

SURVEY MANAGER: L. BURSHTEIN
SURVEY SUPERVISOR: J. CARPENTER
SURVEYOR: JOHN GERD HEIDECKER., L.S.
WELSH ENGR./LAND SURVG,P.C.
DRAWN BY: J.H.
DATE: 8–29–2013
SCALE: 1"= 20'
DISCIPLINE CODE: SU

Appendix D

Excavation Work Plan

APPENDIX D – EXCAVATION WORK PLAN

This Excavation Work Plan ("EWP") applies to the following portions of the Controlled Properties of the Mount Vernon Former Manufactured Gas Plant Site ("Site") at the depths specified below and in Figure D-1 (same as SMP Figure 2-4):

Covered Portion of Controlled Property	Current Owner	Current Use
Portion of Block 3057, Lot 5 Located South of 338 S. 8th Avenue	Greater Centennial Homes HDFC	Apartment Buildings and Tenant Parking Lot
Block 3057, Lot 15	359 South 9th Avenue LLC	Apartment Building and Tenant Parking Lot
Portion of Block 3058, Lot 1 Located North of 408 S. 8th Avenue and Tenant Parking Lot Adjacent to 407 S. 9th Avenue	Greater Centennial Homes HDFC	Apartment Buildings
Block 3063, Lot 1	Mt. Zion Christian Baptist Church	Convenience Store
Block 3063, Lot 41	Mt. Zion Christian Baptist Church	Church
Portion of Block 3064, Lot 26 Located South of 357 S. 8th Avenue	Greater Centennial Homes HDFC	Apartment Building and Associated Parking Lot

The ground-intrusive activities that are subject to this EWP are as follows:

- Excavation/disturbance of subsurface soils beneath the foundation slabs of the existing buildings on the portions of the Controlled Properties identified above;
- Excavation/disturbance of subsurface soils beneath the Visible Demarcation Barriers of the Composite Cover Systems ("CCSs") that were installed on the portions of Block 3057, Lots 5 and 15 and Block 3058, Lot 1 identified above as part of the NYSDEC-approved remedy for the Site. The locations of the CCSs and the approximate depths of their Visible Demarcation Barriers are shown in Figure D-1;

- Excavation/disturbance of subsurface soils at depths of two feet or more bgs on the portions of Block 3057, Lots 5 and 15 and Block 3058, Lot 1 identified above that are not covered by buildings or CCSs; and
- Excavation/disturbance of subsurface soils beneath the water table on Block 3063, lot 1 and 41.

D-1 NOTIFICATION

At least 15 days prior to the start of any planned activity that includes the excavation/disturbance of subsurface soils in the areas and at the depths specified above and in Figure D-1, the owner of the affected Controlled Property or the owner's representative shall notify the New York State Department of Environmental Conservation ("NYSDEC" or "Department") and Consolidated Edison Company of New York, Inc. ("Con Edison"). In the event of an emergency (e.g., repair of a damaged subsurface utility line) that requires the prompt excavation/disturbance of subsurface soils in the areas and at the depths specified above and in EWP Figure D-1, the owner of the affected Controlled Property or representative shall provide the NYSDEC and Con Edison with such advance notification as may be reasonable under the circumstances. Currently, these notifications will be made to:

NYSDEC Project Manager:
Name: Current NYSDEC Project Manager
Address: New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway 11th floor,
Albany, New York 12233-7014
Telephone: (518) 902-9662

Con Edison Director of Remediation Group – EH&S Department:
Name: Direct of Remediation
Address: 31-01 20th Avenue, Astoria, New York 11105
Telephone: (718) 204-4145

The required notification shall include:

- A detailed description of the work to be performed, including: the location and areal extent of the subsurface soil excavation/disturbance; the equipment, facilities or utilities to be installed as part of the work; estimated volumes of subsurface soils to be excavated; disposal plans for excess soil; and plans for restoring any portion of a CCS affected by the work.

- An anticipated schedule for the work, detailing the start and completion of the subsurface soil excavation/disturbance and the restoration of any CCS affected by the work.

For ground intrusive work expected to be deeper than the demarcation boundary within areas covered by CCSs, Con Edison will review the results of the post-remedial excavation confirmatory sampling conducted to evaluate whether potential MGP-related impacts may be encountered. For ground intrusive work beneath the foundation slabs of buildings or areas not covered by CCSs, Con Edison will evaluate existing data and information to determine the potential to encounter MGP-impacted soil and or groundwater. If Con Edison in consultation with NYSDEC deems it necessary, Con Edison will collect and analyze samples of the environmental media from the planned work area to determine the concentrations of MGP-related COCs present. Based upon the post-remedial excavation confirmatory sampling or new sampling results, Con Edison will either:

(1) Notify the NYSDEC and the owner of the affected Controlled Property that MGP-related COCs at levels above the NYSDEC Soil Cleanup Objectives are not present and that no extraordinary measures beyond routine construction or utility related work safety measures are necessary for the ground intrusive work; or

(2) Notify the NYSDEC and owner of the affected Controlled Property that Con Edison will excavate/remove and or isolate the MGP-contaminated media (e.g., soil and or groundwater) that would otherwise be encountered during the planned ground intrusive work before the affected Controlled Property owner or its representatives begin implementing that work. In this case, Con Edison will prepare an Excavation Work Plan that specifies the measures that it will take to remove or isolate the impacted material in advance of the owner's intrusive work, as outlined in the remainder of this appendix.

In either case, Con Edison will submit written notification to NYSDEC that includes the following:

- A summary of environmental conditions anticipated in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling.
- A schedule for the work, detailing the start and completion of all intrusive work.

The EWP will include:

- A summary of the applicable components of this EWP.
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120,
- A copy of the contractor's health and safety plan, in electronic format, if it differs from the HASP provided in Appendix E of the NYSDEC-approved SMP for the Mount Vernon Former Manufactured Pas Plant Site.
- The off-Site facilities that will be used for the disposal or treatment of the MGP-contaminated waste streams generated by the ground intrusive work.
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

It is noted that, simple excavations may only require compliance with a portion of the EWP. For example, excavation of a small volume of soil from above the water table that is directly loaded for off-site disposal would not require the stockpiling or fluids management provisions of this template.

D-2 SOIL SCREENING METHODS

If implementation of this EWP is required, visual, olfactory and instrument-based soil screening will be performed by a qualified environmental professional during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed regardless of when the invasive work is done and will include all excavation and invasive work performed during development, such as excavations for foundations and utility work, after NYSDEC's approval of the SMP.

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal, material that requires testing, material that can be

returned to the subsurface of the Site, and material that can be used as cover soil at the Site.

D-3 STOCKPILE METHODS

Soil stockpiles will be maintained on tarps and/or polyethylene sheeting. Soil stockpiles containing known or suspected MGP-related COCs at concentrations exceeding above NYSDEC Soil Cleanup Objectives will be continuously encircled with a berm and/or silt fence. Water draining from the excavated soils containing known or suspected impacts will be collected from inside the bermed area and disposed of off-site in an appropriate manner. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

Stockpiles containing known or suspected MGP-related COCs at concentrations exceeding NYSDEC Soil Cleanup Objectives will be kept covered at all times with appropriately anchored tarps or plastic sheeting. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. Stockpiled material not being reused will be removed promptly following receipt of waste characterization.

D-4 MATERIALS EXCAVATION AND LOAD OUT

A qualified environmental professional or person under the supervision of such a professional will oversee all ground intrusive work and the excavation and load-out of all excavated material containing known or suspected MGP-related COCs at concentrations exceeding NYSDEC Soil Cleanup Objectives.

It is noted that if the NYSDEC, in consultation with Consolidated Edison, determines that any proposed intrusive activities on a Controlled Property does not require any extraordinary measures (e.g., waste management, special training for workers, etc.) then the owner will be authorized to conduct the work. In this case, the owner of the Controlled Property and its contractors will be solely responsible for safe execution of all invasive and other work performed under this EWP. If work will be performed in a CCS

above the demarcation boundary (i.e., in the clean soil cap), then the excavated soil will need to be stockpiled and placed back in the excavation.

Loaded vehicles leaving the affected Controlled Property will be appropriately lined, tarped, securely covered, manifested and placarded in accordance with appropriate Federal, State, local and NYSDOT requirements (and all other applicable transportation requirements).

Locations where vehicles enter or exit the affected Controlled Property shall be inspected daily for evidence of off-site soil tracking.

The qualified environmental professional will be responsible for ensuring that all egress points for trucks and equipment transport from the affected Controlled Property are clean of dirt and other materials derived from the affected Controlled Property during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to site-derived materials.

D-5 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

At a minimum, trucks should have competent cover system and functional tailgates to prevent leakage of liquids. Trucks transporting residual MGP-contaminated soils shall be lined with 6-mil polyethylene sheeting large enough to fully cover the top of the load. Additional automatic mesh tarps will be used to secure the liners. Loose fitting canvas type truck covers will be prohibited. If a load contains wet material capable of producing free liquids, truck liners will be used. All trucks transporting residual MGP contamination will be decontaminated prior to leaving the affected Controlled Property. Decontaminated water, if any, will be collected and disposed of off-site in an appropriate manner.

Truck transport routes selection will be based on the following factors:

(a) Limiting transport through residential areas and past sensitive sites.

(b) Use of city mapped truck routes.

(c) Minimizing off-Site queuing of trucks entering the Site.

(d) Limiting total distance to major highways.

(e) Promoting safety in access to highways.

Selection of the actual trucking route will be determined by Con Edison provided that the general criteria listed above are satisfied.

It is the responsibility of the party implementing the EWP and transport of such materials to follow all applicable state, local and municipal rules, regulations and guidelines (including NYSDOT) regarding truck routes.

Trucks will be prohibited from stopping and idling in the neighborhood outside the affected Controlled Property.

Egress points for truck and equipment transport from the affected Controlled Property will be kept clean of dirt and other materials during site remediation and development.

D-6 MATERIALS DISPOSAL OFF-SITE

All soil/fill/solid waste excavated and removed from Controlled Property areas known or suspected to have residual MGP contamination will be treated as contaminated and regulated material and will be transported and disposed of in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of soil/fill from an affected Controlled Property is proposed for unregulated off-site disposal (e.g., clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

Off-site disposal locations for excavated soils will be identified in the pre-excavation notification. This will include estimated quantities and a breakdown by class of disposal facility if appropriate, i.e. hazardous waste disposal facility, solid waste landfill, petroleum treatment facility, C/D recycling facility, etc. Actual disposal quantities and associated documentation will be reported to the NYSDEC in the Annual Review Report. This documentation will include: waste profiles, test results, facility acceptance letters, manifests, bills of lading and facility receipts.

Non-hazardous historic fill and contaminated soils taken off-site will be handled, at a minimum, as a Municipal Solid Waste per 6 NYCRR Part 360-1.2. Material that does not meet Track 1 unrestricted SCOs is prohibited from being taken to a New York State recycling facility (6NYCRR Part 360-16 Registration Facility).

D-7 MATERIALS REUSE ON-SITE

This section provides details for methods to be followed for materials reused on-site. "Reuse on-site" means re-use of on-site material that originates at the project site and which does not leave the project site during the excavation. Soil and fill excavated from the Site may be reused as backfill material on the Site provided the soil or fill contains no visual or olfactory evidence of contamination and that it meets the restricted residential SCOs. Soil and or fill excavated as part of the work at the project site that exhibits evidence of contamination shall be disposed off-site as detailed in this EWP. Any excavated material proposed for reuse will require NYSDEC approval prior to its reuse on-site.

The qualified environmental professional will ensure that procedures defined for materials reuse by NYSDEC and DER-10 are followed, and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for re-use on-site will be placed two (2) feet below grade or deeper, and will not be reused as part of a CCS, within landscaping areas or as backfill for subsurface utility lines.

Excavated material not being re-used on site and destined for off-site disposal will be sampled and analyzed for waste characterization purposes prior to off-site transportation and treatment/disposal in accordance with the specific requirements of the receiving facility.

Any demolition material proposed for reuse on-site will be sampled for asbestos and the results will be reported to the NYSDEC for acceptance. Concrete crushing or processing on-site will not be performed without prior NYSDEC approval. Organic matter (wood, roots, stumps, etc.) or other solid waste derived from clearing and grubbing will not be reused on-site.

D-8 FLUIDS MANAGEMENT

All liquids to be removed from an affected Controlled Property, including excavation dewatering and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of an affected Controlled Property, but will be managed off-site.

Discharge of water generated during large-scale construction activities to surface waters (i.e. a local pond, stream or river) will be performed under a State Pollution Discharge Elimination System (SPDES) permit or transported and disposed off-Site

D-9 COVER SYSTEM RESTORATION

After the completion of soil removal and any other ground intrusive work, the portion of any CCS disturbed by the work will be restored. If applicable, Figure 1-3 of the SMP will be updated to show the revised residual MGP contamination. The revised figures will be updated in the subsequent Annual Review Report and in any updates to the SMP. If the type of cover system changes from that which exists prior to the excavation (e.g., a soil cover is replaced by asphalt), this will constitute a modification of the cover element of the remedy. A figure showing the modified surface will be included in the subsequent Annual Review Report and in any updates to the Site Management Plan.

D-10 BACKFILL FROM OFF-SITE SOURCES

Backfill materials utilized at the Controlled Properties of the Site will be obtained from a NYSDOT approved source. The following material may be imported and used as backfill without chemical testing:

- Rock or stone, consisting of virgin material from a permitted mine or quarry; and,
- Granular fill material (less than 10% passing #80 sieve) that is virgin material from a NYSDOT approved source.

It is noted that routine top soil may be used for the upper foot for general landscaping and or deeper where vegetation with extensive root system that locally requires excavations deeper than the upper foot.

Should the backfill material not meet one of the above requirements, the material will be tested via the requirements of DER 10 Section 5.4(e)10 for each source area and analyzed by a NYSDOH-certified Environmental Laboratory Accreditation Program ("**ELAP**")-approved laboratory. The material will be used as backfill only if the analytical results do not exceed the Soil Cleanup Objectives found in NYSDEC Environmental Programs Subpart 375.

All materials proposed for import onto the Controlled Properties of the Site will be approved by the qualified environmental professional and will be in compliance with provisions in this SMP prior to receipt at the Site.

Material from industrial sites, spill sites, or other environmental remediation sites or potentially contaminated sites will not be imported to the Site.

All imported soils will meet the backfill and cover soil quality standards established in 6NYCRR 375-6.7(d). Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers. Imported soils will be stockpiled separately from excavated materials and covered to prevent dust releases.

D-11 STORMWATER POLLUTION PREVENTION

A Stormwater Pollution Prevention Plan will be developed for any future Controlled Property development activities affecting an area greater than one acre and will conform to the requirements of the NYSDEC Division of Water guidelines and NYS regulations. As part of the Stormwater Pollution Prevention Plan the following measures will be implemented:

- Barriers and hay bale checks will be installed and inspected once a week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC. All necessary repairs shall be made immediately.

- Accumulated sediments will be removed as required to keep the barrier and hay bale check functional.
- All undercutting or erosion of the silt fence toe-anchor shall be repaired immediately with appropriate backfill materials.
- Manufacturer's recommendations will be followed for replacing silt fencing damaged due to weathering.
- Erosion and sediment control measures identified in the SMP shall be observed to ensure 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.
- Silt fencing or hay bales will be installed around the entire perimeter of the construction area.

D-12 CONTINGENCY PLAN

If MGP-related underground tanks or other previously unidentified MGP-related contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition.

Sampling will be performed on such product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for full a full list of analytes (TAL metals; TCL volatiles and semi-volatiles, TCL pesticides and PCBs), unless the Site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected MGP-contaminated media identified by screening during invasive site work will be promptly communicated by phone to NYSDEC’s Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the periodic reports prepared pursuant to Section 5 of the SMP.

D-13 COMMUNITY AIR MONITORING PLAN

During the performance of ground-intrusive work at depths greater than those specified in EWP Figure D-1, community air monitoring will be conducted in compliance with NYSDOH Generic Community Air Monitoring Plan ("**CAMP**"). Real-time air monitoring for volatile compounds and particulates at the perimeter of the work zone will be performed as described below.

Organic Vapor Monitoring

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 levels or concentrations during 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 shut down.

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

Particulate Monitoring

During the performance of ground-intrusive work at depths greater than those specified in EWP Figure D-1, particulate concentrations will be monitored continuously at the downwind perimeter of the work zone with a portable real-time particulate monitor capable of measuring particulate matter less than 10 micrometers in size and capable of integrating over a period of 15 minutes (or less). The equipment will include an audible alarm to indicate exceedence of the action level. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background concentrations. The following actions will be taken based on particulate concentrations measured:

- If the measured downwind particulate level is 100 micrograms per cubic meter (μg/m3) or more above background for the 15-minute period or if dust is observed leaving the work area, then dust suppression techniques will be employed. Work will continue with dust suppression provided that the downwind particulate level does not exceed 150 g/m^3 above background and no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, the downwind particulate level is greater than 150 $\mu g/m^3$ above background, 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 particulate level to within 150 $\mu g/m^3$ of the background (upwind) level and in preventing visible dust migration. All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review.

The HASP, which is provided in Appendix E of the SMP for the Site, includes the monitoring requirements outlined in NYSDOH's Generic CAMP. A project-specific CAMP will be developed prior to the start of Site work. Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

Air sampling stations will be placed upgradient and down gradient of generally prevailing wind conditions. These locations will be adjusted on a daily or more frequent basis based

on actual wind directions to provide an upwind and at least two downwind monitoring stations.

Exceedances of action levels listed in the CAMP will be reported to NYSDEC and NYSDOH Project Managers.

D-14 ODOR CONTROL PLAN

Fugitive emission of odor can be generated at the Controlled Properties of the Site during ground-intrusive activities and the related temporary staging of excavated materials.

This odor control plan is capable of controlling emissions of nuisance odors off-site if nuisance odors are identified at the boundary of a Controlled Property, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the Remediation Engineer or the owner of the Controlled Property at which ground-intrusive work that is generating nuisance odors is being performed, and any measures that are implemented will be discussed in the Annual Review Report.

All necessary means will be employed to prevent on-Site and off-Site odor nuisances. At a minimum, measures available to be employed include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors develop and cannot be otherwise controlled, additional means available to eliminate odor nuisances include: (d) direct load-out of soils to trucks for off-Site disposal; (e) use of chemical odorants in spray or misting systems; and (f) use of staff to monitor odors in surrounding neighborhoods.

If nuisance odors develop during intrusive work and cannot be corrected, or where the control of nuisance odors cannot otherwise be achieved due to on-Site conditions or close proximity to sensitive receptors, odor control will be achieved by sheltering the excavation and handling areas in a temporary containment structure equipped with appropriate air venting/filtering systems.

D-15 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during ground-intrusive work on the Controlled Properties of the Site will include, at a minimum, the items listed below:

- Dust suppression will be achieved through the use of a dedicated on-site water truck for road wetting. The truck will be equipped with water cannon capable of spraying water directly onto off-road areas including excavations and stockpiles.
- Gravel will be used on roadways to provide a clean and dust-free road surface.
- On-site roads will be limited in total area to minimize the area required for water truck sprinkling.

D-16 OTHER NUISANCES

A plan for rodent control will be developed and utilized by the contractor prior to and during site clearing and site grubbing, and during all remedial work.

A plan will be developed and utilized by the contractor for all remedial work to ensure compliance with local noise control ordinances.

LEGEND

- BUILDING
- FENCE
- DEED RESTRICTION AREA AND SITE MANAGEMENT PLAN APPLIES
- SITE MANAGEMENT PLAN ONLY AREAS

} THESE AREAS ENCOMPASS THE **CONTROLLED PROPERTIES**

- C — **CONTROLLED BUILDING**

AREAS WHERE SUBSURFACE ACTIVITIES ARE SUBJECT TO THE EXCAVATION WORK PLAN

- EXCAVATIONS > 3 FT BGS. REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS > 15 FT BGS. REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS > 18 FT BGS REQUIRES RESTORATION OF ISOLATION CAP / DEMARCATION BARRIER
- EXCAVATIONS BELOW CONTROLED BULDINGS
- EXCAVATIONS BELOW 2 FT BGS IN AREAS WITHOUT ISOLATION CAP OR NOT COVERED BY CONTROLLED BUILDING.
- EXCAVATIONS BELOW GROUNDWATER TABLE (APPROXIMATELY 12FT. BGS)
- EXCAVATIONS OF SOIL BELOW 10 FT BGS AT IN-PLACE TREATMENT AREA.

FT BGS – FEET BELOW GROUND SURFACE

30’ 0 60’

GRAPHIC SCALE 1”=60’

AECOM

FORMER MGP SITE MOUNT VERNON, NEW YORK 60282939-200			**INSTITUTIONAL CONTROLS AND AREAS SUBJECT TO THE EXCAVATION WORK PLAN**
DATE: 09/15/14	DRWN: RCW		**FIGURE D-1**

File: T:\PROJECTS\Consolidated Edison NY\Mt Vernon\60282939\CADD\60282939-C-05.dwg Layout: D-1 Institutional Controls User: bourdeauj Plotted: Sep 15, 2014 - 6:13pm Xref's:

Appendix E

E.1 Health and Safety Plan Template

E.2 Generic Community Air Monitoring Plan

Appendix E.1

Health and Safety Plan Template

Health and Safety Plan (Template)

Site Management Plan Activities
Former Mount Vernon Manufactured Gas Plant Site
Mount Vernon, NY

August 2013

HEALTH AND SAFETY PLAN APPROVAL

This Health and Safety Plan (HASP) was prepared for the general contractor and their subcontractors performing a specific, limited scope of work. It was prepared based on the best available information regarding the physical and chemical hazards known or suspected to be present in the work area. While it is not possible to discover, evaluate, and protect in advance against all possible hazards, which may be encountered during the completion of the work, adherence to the requirements of the HASP will significantly reduce the potential for occupational injury.

By signing below, I acknowledge that I have reviewed and hereby approve the HASP for the work. This HASP has been written for the exclusive use of the contractor and their subcontractors. The plan is written for specified site conditions, dates, and personnel, and must be amended if these conditions change.

Approved by: _____

Approved by: _____

Table of Contents

ATTACHMENTS

A HASP Sign-off Sheet

B Job Safety Analysis Forms

C Pre-Entry Briefing Attendance Sheet

Emergency Coordinators / Key Personnel			
Name	**Title**	**Telephone Number**	**Cellular Phone**
	Property Owner		
	Project Manager		
	Project Engineer		
	Site Health & Safety Manager		

Organization / Agency	
Name	**Telephone Number**
Police Department	911
Fire Department	911
State Police	911
Ambulance Service ***(EMT will determine appropriate hospital for treatment)***	911
Poison Control Center	800-222-1222
National Response Center	800-424-8802
Dig Safe NY	811
Con Edison Bronx/Westchester Control Desk	914-925-6219
Con Edison OCCS Desk	718-204-4100.

1.0 Introduction

1.1 HASP Purpose

This Health and Safety Plan (HASP) template accompanies the Site Management Plan (SMP) prepared for the former Mt. Vernon manufactured gas plant (MGP) Site located in Mt. Vernon, New York, (the Site), which has been fully remediated in accordance with the Remedial Action Work Plans (RAWP). This HASP template should be updated by the party performing any of the work described in the SMP that may result in the potential exposure of contractors to remaining MGP materials present in the areas presented in the SMP. This template provides guidance regarding potential hazards that may be encountered during future redevelopment and post-remedial inspections and monitoring, including:

- Future intrusive construction work (excavations)
- Inspection and maintenance of the composite cover system (CCS)
- Operation, maintenance and monitoring activities for the sub-slab depressurization systems (SSDSs), and the oxygen injection system
- General site inspections

During intrusive work and other field activities, field staff may be exposed to hazards associated with chemicals of concern on and off the Site. As a result, field personnel may be required to have specialized training (i.e. as per 29 CFR 1910.120) or wear personal protective equipment (PPE) suitable for the level of contaminates present. Air monitoring may be required to evaluate contamination levels, ambient air conditions, and to determine if additional PPE is necessary.

Field staff may also be exposed to other hazards that are encountered during field activities including slips, trips, falls, automobiles, traffic, heavy equipment, drill rigs, and winches. Depending upon the time of season, field staff may be exposed to biological hazards, for example insect bites, stings, ticks, and snakes. Meteorological hazards such as lightning, wind, rain, and ultraviolet radiation may also be present.

This HASP template outlines safety and health requirements and guidelines for the work. When implemented, these requirements will help protect site personnel, visitors, the public and environment from exposure to potential safety and health hazards.

This HASP should be updated as conditions change or situations change, usually by addenda to the plan. All field personnel must understand and implement the HASP and any addenda. This HASP will be updated by the party performing the work prior to the commencement of such work.

1.2 Compliance

The general contractor and subcontractors performing work where employees and third party personnel may potentially be exposed to MGP residuals, must comply with Occupational Safety and Health Administration (OSHA) Title 29 of the Code of Federal Regulations (29 CFR 1910), Safety and Health Regulations for General Industry and applicable sections of 29 CFR 1926 Safety and Health Regulations for the Construction Industry. Under OSHA, each employer is required to develop and implement a written site-specific HASP that addresses the safety and health hazards of each phase of site operation and includes the requirements and procedures for worker protection. The minimum elements for this plan are contained in 29 CFR 1910.120(b)(4)(ii).

Subcontractors, visitors, and contract employees are required to be present at a verbal full HASP review given by the site safety officer. Workers coming on to the Site after the work has commenced in the field will also be given a full HASP review before starting work. A copy of the Health and Safety Plan Acceptance Form is provided in Appendix A.

1.3 Health and Safety Expectations

Commitment to safety, health, and environmental excellence requires that all work proceed only after it is safe and environmentally sound to do so. The responsibility for ensuring that this takes place rests with every worker performing the work. Effectively meeting these responsibilities depends upon open communication between individuals and their supervisors prior to work beginning, and – in certain cases – after safety, health and/or environmental issues are identified.

Completing a Job Safety Analysis (JSA) for each phase of the work to beginning that phase will aid in planning safe work performance and will be an integral part of meeting safety, health and environment (SHE) expectations. The JSAs will provide information on how the requirements of major sections of HASP will be met. Particular attention shall be paid to excavations, PPE, fire prevention, machinery and mechanized equipment, electrical safety, public safety requirements, chemical and physical agent, and biological occupational exposure prevention requirements. A copy of the Job Safety Analysis Form is provided in Appendix B.

The ultimate goal of this HASP is to enable each worker to perform their job with zero preventable incidents (OSHA recordables, lost workdays, property damage, etc.). To achieve this goal, everyone on the Site is responsible for eliminating or correcting risky behavior or unsafe conditions. .

1.4 Management of Change/Modification of the HASP

This document discusses the physical, chemical, and biological hazards associated with the proposed activities. However, unanticipated site-specific conditions or situations might occur during the implementation of the work. Also, contractors may elect to perform certain tasks in a manner that is different from what was originally intended due to a change in field conditions. As such, this HASP must be considered a working document that is subject to change as field conditions and planned activities change.

Should significant information become available regarding potential on-site hazards, it will be necessary to modify this HASP. Any significant modifications must be incorporated into the written document as addenda. The HASP addenda shall be distributed during the daily safety meeting so that they can be reviewed and discussed.

1.5 Multiple Employers

Under OSHA, each contractor is required to provide a safe and healthful working environment for employees. When several contractors are working simultaneously to complete the work, the activities of one contractor could expose personnel of another company to a hazard.

Where a contractor creates unsafe conditions, that contractor shall be responsible for exercising reasonable diligence to discover the condition, and for taking steps to protect their personnel. When the contractor has authority to correct the hazard, it shall do so. Where the contractor lacks the authority to correct the hazard, the contractor shall ask the creating and/or controlling contractor to correct the hazard; inform its personnel of the hazard; and take reasonable alternative protective measures. In extreme circumstances (e.g., imminent danger situations), the contractor shall remove their personnel from the area to avoid the hazard.

1.6 Visitors

Authorized visitors (e.g., municipal inspectors, etc.) requiring entry to any work location on the Site will be briefed by the PM on the hazards present at that location. Visitors will be escorted at all times at the work location and will be responsible for compliance with their employer's health and safety policies.

2.0 Site Description, History and Scope of Work

This section provides a description of the Mount Vernon Works site and surrounding properties, and a summary of information regarding site ownership and operational history of the former MGP. Also presented are summaries of previously completed site investigation and remediation activities. The historical information presented in the following sections was obtained during preparation of the report titled MGP Historical Investigation Report – Mount Vernon, New York (RETEC, 2002a).

2.1 Site Description

The Mount Vernon Works MGP Site is located between South 8th and 9th Avenues on both sides of West 5th Street in Mount Vernon, Westchester County, New York. The Site and the adjacent properties have been zoned for residential and commercial use. The Site is composed of two rectangular shaped parcels, covering a total land area of approximately 1.95 acres. None of the former MGP facility structures are present above the ground surface at the Site today. Site is covered by approximately 80% housing and parking lots, with the remaining 20% being grassy areas.

2.2 History of Operations

The earliest record of the Mount Vernon MGP shows the Mount Vernon Gas Works located on the northern side of West 5th Street between South 8th and 9th Avenues. According to the Brown's Directories, the Mount Vernon gas plant produced coal gas since at least 1887. By 1893, the carbureted water gas process was also being used to produce gas at the Site. Gas production stopped sometime between 1900, the last year production was reported specifically for Mount Vernon, and 1911, the year the northern parcel with gas production facilities was sold. Mount Vernon MGP Site featured three gas holders, tar and ammonia wells, two coal houses, a purification house, the former retort house, and an unidentified circular structure.

2.3 Site Remedial History

Con Edison performed a site characterization study (SCS) in 2003 and a Remedial Investigation from 2004 to 2005 to delineate the severity and extent of MGP-related contamination. Impacts related to the MGP were encountered in surface soils, subsurface soils, groundwater, and soil gas. These included concentrations of volatile and semi-volatile organic compounds, metals, cyanide, and lenses of coal tar (a non-aqueous phase liquid – NAPL), as well as the subsurface remnants of former MGP structures.

In 2011 and 2012, Con Edison performed remedial actions to address the impacts observed and measured during the remedial investigation. These actions included:

- Surface soil excavations and off-site treatment
- Subsurface soil excavations and off-site treatment
- Removal and off-site disposal of former MGP structures
- Injection of oxidizer to chemically breakdown inaccessible impacts
- Installation of active sub-slab depressurization systems and groundwater sump vent systems to address potential soil gas intrusion, and
- The installation of an active oxygen injection system to treat impacts to groundwater

These actions addressed the majority of the impacted material. However, due to limitations of access to impacted soil and groundwater, some impacts remain. The site management plan (SMP) details where MGP-related impacts may remain, and the locations of the remedial systems currently operating. This plan should be reviewed to determine if the planned scope of work will be performed in an area where MGP impacts remain, and if the depth of the excavation will encounter those impacts in soil or groundwater. This HASP includes an overview of the hazards associated with the remaining MGP impacts and the appropriate

measures to address potential exposure to those hazards during future property redevelopment, site construction and or routine site maintenance activities. .

2.4 Scope of Work

Activities performed under this HASP may include:

- Excavation of soil in portions of the site where MGP impacts are expected to remain.
- Dewatering of excavations
- Operation, maintenance, and monitoring of mechanical systems including the oxygen injection, sub-slab venting, and groundwater sump pit venting systems
- Management of soil and groundwater generated during intrusive activities
- Groundwater monitoring
- Inspections of the composite cover system
- Perform operation and maintenance activities per scope and schedule outlined in the O&M work plan. These activities may include: balancing oxygen flows, checking the system for leaks and or other issues and groundwater monitoring, etc.
- Perform periodic site inspections of engineering and institutional controls.

2.5 Waste Management

Waste which may be generated during the work includes the following:

- Soil generated from excavations
- Water generated from excavation dewatering
- Trash and construction debris.
- Used personal protective equipment (PPE)
- Groundwater from well purging during monitoring and excavation dewatering.

Wastes will be managed and shipped in accordance with all applicable state and federal regulations.

MGP impacted soils generated from excavations will be handled in accordance with the Excavation Work Plan in Appendix D of the SMP. Soils will be stockpiled on site and covered with plastic sheeting, sampled for waste characterizations parameters, and shipped off-site for disposal. Alternately, soils may be sampled in-place prior to excavation activities, samples submitted for analyses, and then direct loaded into trucks/roll-off containers for off-site disposal. Water generated from excavation dewatering will be stored in appropriately sized containers, sampled for waste characterization parameters before being shipped or discharged and or treated.

Used PPE which may be contaminated and groundwater will be stored in drums, labeled, and stored onsite until approval from a disposal or treatment facility is obtained. While waiting for approval, drums will be stored inside the locked treatment system fence enclosure. These wastes will be transported off-site to permitted facilities. Trash and other un-impacted material will be disposed of in an appropriate receptacle.

3.0 Chemical Hazard Assessment and Control

3.1 Chemical Contaminants of Concern

The predominant contaminants of concern (COC) associated with this Site are constituents of the manufacturing gas process which include but not limited to: Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), including Poly-Aromatic Hydrocarbons (PAHs) and purifying waste.

Intrusive activities involving drilling/excavation/handling of contaminated materials or contact with site groundwater have the potential to cause significant exposures to site personnel through inhalation, skin

contact, and ingestion of the contaminants found in the soils and water. Exposure can exceed permissible exposure limits for any or all contaminants and have the potential to produce significant harm to individuals who are not adequately protected (use of proper PPE) and do not perform proper decontamination when leaving Exclusion Zones.

3.2 Volatile Organic Compounds

Volatile Organic Compounds refer to a group of volatile compounds or mixtures that are relatively stable chemically and that exists in the liquid state at temperatures of approximately 32° to 82°F. Inhalation and skin absorption are the primary routes of exposure. Organic compounds are metabolized or they accumulate in the lipid-rich tissues such as the liver, fat cells, or the nervous system. At this site, these compounds include benzene, ethyl benzene, toluene, and xylenes. See the table in Section 3.7 for compound specific information and monitoring action levels.

3.3 Semi-Volatile Organic Compounds

Semivolatile Organic Compounds (SVOCs) are less volatile chemicals that tend to persist in the environment. Typical coal gasification byproduct (coal tar) constituents are referred to as polynuclear aromatic hydrocarbons (PAH) compounds. PAH compounds are a family of multiple ring aromatic compounds commonly found in fossil fuels and are formed from the incomplete combustion of organic materials. Repeated contact with PAH compounds may cause photosensitization of the skin, producing skin burns after subsequent exposure to ultra-violet light. Certain PAHs as a group are considered potential human carcinogens (CaPAH). OSHA regulates PAHs as coal tar pitch volatiles (CTPV) and has established a PEL for CTPV of 0.2 mg/m^3, as an 8-hour TWA. See the table in Section 3.7 for compound specific information and monitoring action levels.

3.4 Cyanide

Cyanide wastes were not generally detected or encountered at the Mt. Vernon former MGP site either during investigation or during remedial excavation of soils, etc. However, cyanide wastes can occur at MGP sites. And when present they typically exist as stable iron cyanide complexes, such as ferric ferrocyanide. Blue staining (Prussian Blue) in soil is the characteristic associated with the presence of oxide box wastes (ferrocyanide). Therefore, the presence of this material is very easily identified during intrusive activities. The cyanides associated with these waste are typically present in a form that is generally stable and do not pose a substantial health risk. Consistent with the inherent chemical stability and minimal, if any, potential health risk, OSHA has not established a PEL for ferro/ferri cyanide compounds. Similarly, the ACGIH has not recommended a TLV for these compounds.

3.5 Dust

Dust generated during excavations can be hazardous to the respiratory system and irritating to the eyes. Dust can also carry the contaminants of concern potentially exposing workers by skin contact and inhalation. The ACGIH has established an eight-hour exposure limit for dust at 3 mg/m^3. The concentrations of the chemicals of concern in the soil are low enough that inhalation of dust would not by itself be an exposure hazard. However contamination of skin and clothing can provide additional exposures. Therefore the generation and contact with dust should be minimized.

Water or other methods should be used to control dust during dusty operations; however care must be used to prevent electrical shock if electric tools are used in the same area. Water use should be limited to prevent erosion and sedimentation from the site to nearby catch basins or other drainage features. If dusts become irritating and engineering controls such as the application of water cannot be used, respirators shall be donned as discussed in Section 7.

3.6 Other Chemicals

Other chemical hazards that may be present in various forms include the following:

- Fuel and lubricants (e.g., gasoline, diesel fuel, hydraulic oil)
- Cleaning agents (e.g., detergents, hand cleaner)
- Miscellaneous chemicals (e.g., marking paints, bulk office supplies)

3.7 Summary of Hazardous Properties of Potential Contaminants

Chemical Name	Characteristics	PEL[1]	TLV[2]	VP[3]	VD[4]	SG[5]	SOL[6]	FP[7]	LEL[8]	UEL[9]	IP[10]
Benzene	Clear, colorless liquid with an aromatic odor, low vapor pressure, high flammability, vapors heavier than air, evaporates very quickly, inhalation is the most likely route of exposure. Can cause drowsiness. Benzene is considered by the EPA to be a human carcinogen.	1	0.5	75	2.8	0.88	<1	12	1.2	7.8	9.24
Toluene	Colorless, flammable liquid, a mild (aromatic) odor. Enters the body when inhaled, ingested, or absorbed through the skin contact, does not remain in the body due to its breakdown and removal. Can cause nausea and dizziness, irritation of the mucous membranes of the upper respiratory tract, nose and mouth.	200	50	21	4	0.87	<1	40	1.1	7.1	8.82
Ethyl Benzene	Colorless, flammable liquid, enters the body when inhaled, ingested, or absorbed through the skin contact.	100	100	7	4	0.87	<1	55	0.8	6.7	8.76
Xylene	A colorless, flammable liquid, a mild (aromatic) odor. Enters the body when inhaled, ingested, or absorbed through the skin contact, does not remain in the body due to its breakdown and removal. Can cause nausea and dizziness.	100	100	9	4	0.86	<1	81	1.1	7.0	8.56
Naphthal-ene	Characteristic moth-ball like odor. May cause nausea, vomiting, abdominal pain and irritation of the bladder. Prolonged overexposure may result in renal shut down. May cause rashes and allergy.	10	10	1	4.4	1.2	<1	189	0.9	5.9	8.12

Chemical Name	Characteristics	PEL[1]	TLV[2]	VP[3]	VD[4]	SG[5]	SOL[6]	FP[7]	LEL[8]	UEL[9]	IP[10]
Phenol	A combustible liquid, corrosive, hygroscopic, and light sensitive material. Can be harmful if inhaled, swallowed, or absorbed through the skin and rapidly to cause systemic poisoning and possible death.. Can cause Central Nervous System (CNS) depression, central nervous system effects, eye and skin burns, liver and kidney damage, severe respiratory tract irritation with possible burns, and severe digestive tract irritation with possible burns.	5	5	0.4	3.5	1.06	9	175	1.8	8.6	8.50

1 Permissible Exposure Limit in ppm
2 Threshold Limit Value in ppm
3 Vapor Pressure in mm Hg
4 Vapor Density (air = 1)
5 Specific Gravity (water = 1)
6 Solubility in Water in %
7 Flash Point in °F
8 Lower Explosive Limit in % by volume
9 Upper Explosive Limit in % by volume
10 IP in eV
NA = Not Applicable
? = Not known
C = Ceiling limit not to be exceeded

3.8 Chemical Exposure and Control

3.8.1 Chemical Exposure Potential

Activities which could potentially lead to chemical exposures include the following:

- Soil excavation
- Waste management

A route of potential exposure to the contaminants of concern is via absorption through direct dermal contact with impacted soils or groundwater, inhalation of vapors or aerosols, and incidental ingestion of soil and/or water. This section outlines some of the controls to eliminate/reduce potential exposure. In addition, Section 8.0 outlines control zones to be established around the work area, Section 7.0 describes personal protective equipment (i.e. gloves, hardhat, work boots, etc.), and Section 9.0 discusses decontamination procedures to address personal hygiene issues that will limit / eliminate the potential for contaminant absorption, inhalation, and ingestion.

3.8.2 Chemical Hazard Control

The chemical hazards associated with these activities can be controlled in several ways, including:

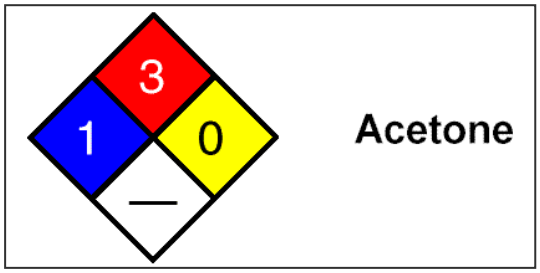
- Maintain an upwind position
- Use of personal protective equipment
- Avoid direct contact with contaminated media
- Follow decontamination procedures
- Wash hands prior to eating or using tobacco products.

3.8.3 Compressed Oxygen

There are several precautions which need to be taken when handling, storing and using compressed oxygen. The compressed oxygen cylinders on site are used for the oxygen injection system and stored in a secure location. Therefore, only properly trained personnel working with that system should come in contact with those cylinders.

Oxygen is considered a hazardous material. Oxygen cylinders are never to be stored near highly combustible materials, especially oil and grease. It can promote combustion of flammable materials. Accordingly, it is important to: 1) provide good ventilation, 2) keep flammable materials out of areas where high concentrations of oxygen may be present, and 3) leak test fittings and valves when oxygen cylinders are changed.

3.9 Hazard Communication Program



The purpose of a Hazard Communication Program is to ensure that the hazards of all chemicals used during the completion of the work are evaluated, and that information concerning their hazards is transmitted to contractors and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs in compliance with 29 CFR 1910.1200. Aspects of this program include properly labeling all containers with the contents and associated hazards, such as the label to the right. The program with identify a list of the hazardous chemicals to be used and a description of where Material Safety Data Sheets (MSDSs) will be located on site, such as included as an appendix to the final HASP.

4.0 Biological / Environmental Hazards and Controls

During the course of field work, contractors are at risk of being exposed to poisonous plants, insects, spiders and snakes. The two most prevalent biological hazards are poison ivy and ticks. Site activities will take place in an urban area on a grassed lawn. For that reason, exposure to poisonous plants is unlikely. There are potential exposures to some animals including dogs and rats associated with trash receptacles and insects such as ticks, bees, and spiders.

4.1 Poison Ivy

Poison ivy is a common cause of a skin irritation called contact dermatitis that may result in a red, itchy rash consisting of small bumps, blisters or swelling. It grows in sun or shade, and in wet or dry places, and may be in a trailing ground cover, free-standing shrub, or a vine supported by trees, shrubbery and fences. All parts of the poison ivy plant contain, urushiol, which causes the allergic reaction. Most poisoning occur during the growing season when the presence of lush foliage increases the chance of contact, but the dormant stems and roots of the vine can cause winter poisoning as well.

The best defense against contracting poison ivy is to recognize the plants. “Leaves of three, let it be” refers to the groupings of three leaflets connected to a common stem that characterize most of these plants. However, if you cannot avoid poison ivy, follow these precautions to help prevent contact:

- Wear protective clothing such as long-sleeved shirts, long trousers, boots or sturdy shoes with socks and gloves
- Use a barrier cream such as CoreTex IvyX™ Pre-Contact solution
- As soon as possible (within 5–10 minutes of contact), wash all exposed skin with strong soap (i.e. Dawn) and water to remove the oil. If this is not possible, rinse thoroughly with water;
- Use a post-contact skin cleanser such as Tenu® skin cleanser or CoreTex IvyX™ cleanser towelettes.
- Put on gloves to remove clothes and shoes, and wash clothing in hot water and detergent to remove any plant oil that may be on them.
- If a severe allergic reaction develops seek medical attention.

4.2 Ticks

Ticks transmit bacteria that cause illnesses such as Lyme disease. Ticks wait for host from the tips of grasses and shrubs (not from trees). When brushed by a moving person, they quickly let go of the vegetation and climb onto the host. Ticks can only crawl; they cannot fly or jump. Tick season typically lasts from April through October, although ticks can be active on winter days when the ground temperatures are about 45° Fahrenheit.

The best way to protect oneself against tick borne illness is to avoid tick bites. This includes avoiding known tick- infested areas. In wooded areas or areas with tall grass and weeds, follow these precautions to help prevent tick bites and decrease the risk of disease:

- Wear protective clothing such as long-sleeved shirts, long trousers, boots or sturdy shoes and a head covering. (Ticks are easier to detect on light-colored clothing.)
- Tuck trouser cuffs in socks. Tape the area where pants and socks meet so ticks cannot crawl under clothing.
- Apply insect repellent containing 10 percent to 30 percent DEET or 5 percent to 10 percent picaridin primarily to clothes. Apply sparingly to exposed skin.
- Use repellents containing permethrin to treat clothes (especially pants, socks and shoes) but not skin. Always follow label directions; do not misuse or overuse repellents.
- Those who wish to avoid the use of insect repellent or treated clothing should consider the use of the Original Bug Shirt® and pants, and tick/chigger garters.

- Personnel should carefully inspect themselves each day for the presence of ticks or any rashes. This is important since prompt removal of the tick can prevent disease transmission. Removal of the tick is important in that the tick should not be crushed and care must be taken so that the head is also removed. Contact the DSHEM for guidelines on removing ticks.

4.3 Wasp and Bees

Wasps (hornets and yellow-jackets) and bees (honeybees and bumblebees) are common insects that may pose a potential hazard to the field team if work is performed during spring, summer or fall. Bees normally build their nests in the soil. However, they use other natural holes such as abandoned rodent nests or tree hollows. Wasps make a football-shaped, paper-like nest either below or above the ground. Yellow-jackets tend to build their nests in the ground but hornets tend to build their nests in trees and shrubbery. To avoid bees and wasps:

- If you see insects flying to and from a particular place, avoid it.
- If you are going to be in an area where disturbing a nest is likely, wear long pants and a long sleeved shirt. Insect repellent applied to your skin or clothing will not deter these stinging insects.
- Wear light colored clothing.
- Remain as calm as possible if a bee or wasp lands on your skin, but If you don't want to wait for it to leave, gently and slowly brush it away.
- It is best not to wear perfume, cologne, or other scented soaps or scented shampoos as this attracts bees and wasps.
- Never swing, strike or run rapidly away since quick movement often provokes attack and painful stings.
- Restrain from throwing rocks or spraying nests with water.
- Avoid creating loud noises and disturbance near the nest.
- Gently scrape the area of the bite using a blunt object like a fingernail or a credit card to remove the stinger. If removed within 15 seconds of the sting, the severity of the sting is reduced.
- Try not to rub or scratch the sting site after the stinger is removed.
- Wash the sting site with soap and water.
- Apply a cold or ice pack wrapped in cloth for a few minutes.
- If you develop hives, difficulty breathing or swallowing, wheezing or similar symptoms of allergic reaction, SEEK MEDICAL ATTENTION IMMEDIATELY. People with known allergies to insect stings should NEVER work alone.
- A person with a history of severe allergic reaction to an insect sting may be advised by their physician to carry an insect sting allergy kit to counteract the allergic reaction whenever they may encounter stinging insects. Also they should consider wearing a medical ID bracelet and notify others on the field team.

4.4 Heat Related Illnesses

Heat-related illness (HRI) is a well-recognized hazard in the outdoor work environment. HRI includes heat fatigue, heat rash, fainting, heat cramps, heat exhaustion, and heat stroke. Excessive heat exposure is also linked to injuries from falls, equipment operation accidents and other on-the-job incidents due to fatigue, dizziness, and disorientation. Use of impermeable clothing (e.g. Tyvek®) reduces the cooling ability of the body due to evaporation reduction. This may lead to heat stress. Impermeable clothing will only be worn when absolutely necessary for control of hazardous chemicals.

Heat exhaustion: Heat exhaustion typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a form of mild shock. If not treated, the victim may suffer heat stroke. Signals of heat exhaustion include cool, moist, pale flushed or red skin; heavy sweating; headache; nausea or vomiting; dizziness; and exhaustion. Body temperature will be near normal.

Heat stroke: Also known as sunstroke, heat stroke is life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly. Signals include hot, red and dry skin; changes in consciousness; rapid, weak pulse; and rapid, shallow breathing. Body temperature can be very high-sometimes as high as 105 degrees.

4.4.1 General Care for Heat Emergencies

Heat cramps or heat exhaustion: Get the person to a cooler place and have him or her rest in a comfortable position. If the person is fully awake and alert, give half a glass of cool water every 15 minutes. Do not let him or her drink too quickly. Do not give liquids that contain alcohol or caffeine. Remove or loosen tight clothing and apply cool, wet cloths, such as towels or sheets. Call 911 if the person refuses water, vomits or loses consciousness.

Heat stroke: Heat stroke is a life-threatening situation! Help is needed fast. Call 911. Move the person to a cooler place. Quickly cool the body. Immerse victim in a cool bath, or wrap wet sheets around the body and fan it. Watch for signals of breathing problems. Keep the person lying down and continue to cool the body any way you can. If the victim refuses water or is vomiting or there are changes in the level of consciousness, do not give anything to eat or drink.

The guidance below will be used in identifying and treating heat-related illness.

Table 4-1 Identification and Treatment of Heat-Related Illness

Heat-Related Illness	Description	First Aid
Mild Heat Strain	The mildest form of heat-related illness. Victims exhibit irritability, lethargy, and significant sweating. The victim may complain of headache or nausea. This is the initial stage of overheating, and prompt action at this point may prevent more severe heat-related illness from occurring.	• Provide the victim with a work break during which he/she may relax, remove any excess protective clothing, and drink cool fluids. • If an air-conditioned spot is available, this is an ideal break location. • Once the victim shows improvement, he/she may resume working; however, the work pace should be moderated to prevent recurrence of the symptoms.
Heat Exhaustion	Usually begins with muscular weakness and cramping, dizziness, staggering gait, and nausea. The victim will have pale, clammy moist skin and may perspire profusely. The pulse is weak and fast and the victim may faint unless they lie down. The bowels may move involuntarily.	• Immediately remove the victim from the work area to a shady or cool area with good air circulation (*avoid drafts or sudden chilling*). • Remove all protective outerwear. • Call a physician. • Treat the victim for shock. (*Make the victim lie down, raise his or her feet 6–12 inches, and keep him/her cool by loosening all clothing*). • If the victim is conscious, it may be helpful to give him/ her sips of water. • Transport victim to a medical facility ASAP.

Heat-Related Illness	Description	First Aid
Heat Stroke	The most serious of heat illness, heat stroke represents the collapse of the body's cooling mechanisms. As a result, body temperature may rise to 104 degrees Fahrenheit or higher. As the victim progresses toward heat stroke, symptoms such as headache, dizziness, nausea can be noted, and the skin is observed to be dry, red, and hot. Sudden collapse and loss of consciousness follows quickly and death is imminent if exposure continues. Heat stroke can occur suddenly.	• Immediately evacuate the victim to a cool/shady area. • Remove all protective outerwear and as much personal clothing as decency permits. • Lay the victim on his/her back w/the feet slightly elevated. • Apply cold wet towels or ice bags to the head, armpits, and thighs. • Sponge off the bare skin with cool water. • The main objective is to cool without chilling the victim. • Give no stimulants or hot drinks. • Since heat stroke is a severe medical condition requiring professional medical attention, emergency medical help should be summoned immediately to provide onsite treatment of the victim and proper transport to a medical facility.

4.4.2 Heat Stress Monitoring Techniques:

Where Level C protective clothing (see Section 7.0) are used without regards to the use of a respirator, heat stress monitoring should begin when the air temperatures reaches 52°F. Where Level D protective garments are used heat stress monitoring should begin when the air temperature reaches 77°F. Site personnel shall regularly monitor their heart rate as an indicator of heat strain by the following method:

- Check the radial pulse rate using fore- and middle fingers and by applying light pressure to the pulse in the wrist for one minute at the beginning of each rest cycle. If the pulse rate exceeds 110 beat/minute, shorten the next work cycle by one-third and keep the rest period the same. If, after the next rest period, the pulse rate still exceeds 110 beats/minute, shorten the work cycle again by one-third.

4.4.3 Measures to Avoid Heat Stress:

The following guidelines should be adhered to when working in hot environments:

- Know the signs and symptoms of heat related illnesses.
- Observe coworkers for the early symptoms of heat stress-related illnesses as outlined in Table 4-1. Heat Stress Monitoring techniques are provided above.
- Re-evaluate the need for PPE. (Tyvek coveralls could be replaced by an apron).
- Remove excessive PPE at breaks.
- Take frequent breaks.
- Establish work-rest cycles (short and frequent are more beneficial than long and seldom).
- Identify a shaded, cool rest area.
- Rotate personnel, alternative job functions.
- Two 8-ounce glasses of water should be taken prior to beginning work, then up to 32 oz per hour during the work shift; fluid replacement at frequent intervals is most effective.
- The best fluid to drink is water; liquids like coffee or soda do not provide efficient hydration, and may increase loss of water.
- If commercial electrolyte drinks (e.g., Gatorade) are used, the drink should be diluted with water, or 8 ounces of water should be taken with each 8 ounces of electrolyte beverage.
- Eat light meals before and during work shifts. Avoid highly salted foods.
- Save most strenuous tasks for non-peak heat hours such as the early morning or at night.
- Avoid alcohol during prolonged periods of heat. Alcohol will cause additional dehydration.

- Avoid double shifts and/or overtime.

4.5 Severe Weather

Prior to mobilization the field team personnel should be cognizant of the long range and short range weather forecast for the region in which they will be working in. If severe weather is forecasted, work may be temporarily postponed until the weather is more favorable. Dailey field team members should check the weather forecast for inclement or severe weather. A weather radio or radio set on an AM channel is the best sources for weather information and weather alerts. On the internet the Storm Prediction Center's web page can be check for alerts and warnings. http://www.spc.noaa.gov/products/wwa/.

All four seasons can bring about severe weather to the region, ranging from extremely cold temperatures to high winds and thunder and lightning storms. Hurricanes have been known to hit the northeast and while rare tornados do occur in the northeast. In the event of server weather is forecast the following steps should be taken:

- Temporarily stop and secured the site.
- Seek shelter in a vehicle or indoor location.
- Stop all work and seek a safe area when lightning is within range of the site (by the time you hear thunder, you are ALREADY within lightning range). Safe areas include low areas (NOT subject to flash floods), grounded metal structures or vehicles.
- Shut down generators and all electrical motors in an orderly manner to protect the equipment from electrical surges and abrupt power loss.
- Move all personnel off crawler-type equipment and boom equipment. Lower crane booms.
- When working in low areas, be alert for the potential of flash flooding and plan a route to higher ground.
- Work may resume 30 minutes after the last flash of lightning is observed and last rumble of thunder is heard.

5.0 Physical Hazards

5.1 Utility Hazards

Striking buried or overhead utilities can lead to electrocution, fire, explosion, property damage, and/or environmental release. At least three (3) working days prior to initiation of any subsurface work, contact Dig Safe, NY at 811 or (800) 962-7962, and they will contact the utility companies to mark their lines. Also call the public water and sewer departments to mark the locations of their pipes, and request utility plans for the area.

Follow up the call with a visit to the site to visually inspect the mark-outs and the presence of overhead utilities and obstructions within the planned work area. Where the work is performed on private property, public utility companies will not mark, so consult any drawings that are available for each property, look for the physical presence of utilities (i.e. catch basins, access covers, and valve boxes). The use of metal detectors to scan the work area is recommended. Private utility locating companies are also available.

Accidental contact with an energized subsurface or overhead line or arcing between a high power line and grounded equipment can cause electrocution of equipment operators or nearby ground personnel, and damage to power transmission and operating equipment.

Generally, safe working distances from overhead power lines are the following:

Line Voltage (Kilovolts)	Minimum Safe Working Distance
0 – 50	10 feet
>50 – 200	15 feet
>200 – 350	20 feet
>350 – 500	25 feet
>500 – 750	35 feet
>750 – 1000	45 feet

Source: American National Standards Institute, Publication B30.5

5.2 Traffic

The establishment of traffic control plan to adequately protect workers and the public is suggested when performing work in and around roadways and driveways. Traffic control devices in accordance with the Manual of Uniform Traffic Control Devices (MUTCD) should be used on public road ways per accordance with the applicable State regulatory guidance. The plan should evaluate the how to direct vehicles and pedestrians around the work area such that vehicles do not inadvertently enter the work zone, vehicles traveling in opposite directions can pass each other and the work area safely, and pedestrians can pass safely without having to enter traffic areas. Consider the following when developing a plan to mitigate traffic hazards:

- Wear a high visibility vest (an ANSI-approved Class II or III safety vest)
- Position vehicle upstream from work site to begin channeling traffic
- Designate work zone with cones and barriers
- Use trained flaggers or police detail to direct traffic when the work zone and / or activities will block traffic lanes.

5.3 Construction Equipment

Excavation activities often involve the use of heavy equipment, such as backhoes, excavators, and dump trucks, which presents the possibility of contractors being struck by the equipment or caught between the equipment and a fixed object. Control measures to prevent injury may include:

- Backup alarms on all heavy construction equipment
- Proper lock-out/tag-out procedures
- Designated equipment routes and pedestrian/contractor routes including clearly defined control zones as discussed in Section 8.0.

Additionally, the following preventative measures are recommended for all contractors:

- The use of personal protective equipment (hardhat, steel toed boots, safety glasses, and high visibility vests and/or shirts
- When working around the equipment, the contractor should:
    - Make sure that the operator/driver is aware of your presence/activities
    - Stay in the operator's line of sight, don't work in his/her blind spot
    - Approach areas where equipment is operating from a direction visible to the operator
    - Be aware of the swing radius of the excavator and sudden movement of equipment
    - Avoid walking or work underneath loads handled by digging equipment
    - Stand away from trucks being loaded or unloaded
    - Do not stand between the construction equipment and a fixed object such as a wall or another truck.

5.4 Excavation Hazards

The principle hazards associated with excavation and trench activities are striking buried utilities, being struck by material being handled, engulfment from soil caving in, and hazardous atmospheres (hazardous gases/vapors or oxygen deficient). Recommended preventative measures include:

- Prior to performing excavations, clear the area for utilities as discussed in Sections 5.1.
- When personnel are required to enter a trench or excavation over 4 feet deep, an adequate means of exit, such as a ladder, steps, or ramp must be provided at a spacing of no more than 25 feet. In addition, the use of a shoring system, sloping of the ground, or some other equivalent means to protect workers from cave-ins should be evaluated as required by 29 CFR 1926 Subpart P.
- The excavated soil should be temporarily stockpiled on plastic sheeting at one side of the excavation, and the toe of the spoil pile should be at least 2 feet away from the edge of the excavation.
- The use of dewatering equipment and techniques should be considered to prevent cave-ins of excavations extending below the water table.
- Tested for oxygen content, explosive gases/vapors and toxic gases/vapors (i.e. carbon monoxide, hydrogen sulfide, contaminates of concern) prior to and during entry.

5.5 Electrical Hazards

Electric shock, electrocution, burns, fires, and explosion may result from improper use of electric equipment, worn electric cords, the presence of water, and/or contact with overhead or subsurface electric lines. Electrical cords used to carry electrical power also pose a trip and fall hazards. The following precautions should be considered to avoid electrical hazards:

- Prior to performing excavations, call Dig Safely, NY at 811, to have electric utilities marked, and then inspect the site for the locations of overhead and subsurface utilities within the planed work area.
- Inspect electric cords for wear, use cords rated for the equipment to be powered, make sure cords are grounded (three prong)
- Keep cords out of water, and in potentially hazardous environments electrical equipment must meet the National Electrical Code (NEC) classification for hazardous locations. Consult the RHSM for the proper type of equipment
- Place shunt boards over cords or elevate cords to 8 feet to prevent slips, trips, and falls.
- Electric tools should be grounded
- When work is to be performed on electrical equipment, lockout procedures (Con Edison's CEHSP S12.00) are required to ensure that the equipment is de-energized and isolated
- Fuel generators before use and re-fuel only after the engine has been shut down and allowed to cool.

- Never use a portable generator indoors. Locate a generator so that the exhaust is downwind from your position or locations where carbon monoxide can enter (e.g., confined spaces, indoor locations etc.).

All temporary and permanent electrical work, installation, testing and maintenance and all electrical equipment and appliances shall conform to the requirements of the National Electrical Code and comply with the requirements of 29 CFR 1926 Subpart K. Only qualified electricians with full knowledge of the electrical code requirements should be allowed to perform install electric boxes and circuit breakers.

5.6 Back Safety

Back injuries may result from improperly moving heavy objects. Size and weight of the object to be moved and the route to be travelled should be evaluated. Precautions to implement when lifting or moving heavy objects may include:

- Bend at the knees, not the waist.
- Do not twist your body while lifting
- Bring the load as close to you as possible before lifting
- Use mechanical devices to move objects that are too heavy to be moved manually
- If mechanical devices are not available, ask another person to assist you.

5.7 Falls

Falls from slips and trips are common workplace occurrences that can result in serious injuries and disabilities. Slips and trips can be prevented by following these guidelines:

- Keep work areas free of materials, obstructions, and substances that could cause a surface to become slick or otherwise hazardous
- Walk around, not over or on, debris or equipment
- When carrying equipment, identify a path that is clear of any obstructions. It might be necessary to remove obstacles to create a smooth, unobstructed access point to the work areas on site

5.8 Hand Tools

Hazards associated with hand tools are cuts, lacerations, electrocution, and blunt force trama. Frequent and prolonged use of hand tools can cause soreness, aches, pains, and fatigue, which, when ignored, can lead to chronic musculoskeletal injuries (MSIs).

Basic safety rules can help prevent hazards associated with the use of hand tools:

- Use the right tool for particular work activity being conducted
- Avoid using damaged tools
- Use personal protective equipment (e.g., eye protection, gloves, hearing protectors).
- Plastic covered tool handles are for comfort only, not protection from electrical current.
- When working with a wrench, always pull the wrench, never push the wrench.
- Only spark-resistant tools made from brass, plastic, aluminum, or wood to should be used around flammable substances.
- For continuous work, use comfort grips or gloves, take frequent breaks, avoiding awkward positions, and consider using a power tool.

5.9 Noise Exposure

The use of construction equipment can expose employees to noise levels that exceed the OSHA PEL of 90 dB for an 8-hour day. Exposure to noise can result in the following:

- Temporary hearing losses
- Interference with speech communication and the perception of auditory signals (i.e. vehicle backup alarms).
- Permanent hearing loss due to repeated exposure resulting in nerve destruction in the hearing organ.

Potential sources of noise at the site include hand and power tools, vehicles, and heavy construction equipment. A general rule of thumb to prevent hearing damage is if the noise levels are such that you must shout at someone five (5) feet away from you, you need to be wearing hearing protection. Workers can wear either disposable earplugs or earmuffs that should have a minimum noise reduction rating (NRR) of 27 dB.

6.0 Air Monitoring

As a precautionary measure in areas where MGP impacts may be present, a photo-ionization detector (PID) will be used to screen the work area for concentrations of VOCs during subsurface investigations. If the PID indicates sustained (15-minute) breathing zone vapor concentrations in excess of 1 unit or more, Level C respiratory protection, as described in Section 7.0 of this HASP, should be donned.

Dust would be generated during excavation. Depending on the severity of the duct, a light mist of water can be applied to the sidewalls of the excavation to suppress dust generation. If visible dust is generated even after these engineering controls have been implemented, respiratory protection, as described in Section 7.0 of this HASP, should be donned.

During O&M activities for the oxygen injection system, contact with excess oxygen is possible. Procedures for oxygen monitoring are included in the oxygen injection O&M plan included as an appendix to the SMP.

The PID and dust meter should be calibrated every day in accordance with the manufactures instructions. Calibrations and monitoring readings should be recorded in a project field notebook or on dedicated air monitoring result sheets.

7.0 Personal Protective Equipment

In areas of the site where MGP impacts may be present, the proper use of appropriate personal protective equipment (PPE), in combination with effective engineering and administrative controls, can provide subcontractors with adequate protection against potential workplace hazards.

7.1 Level D Ensemble

Level D personal protective equipment for this work may consist of:

- Shirts with sleeves and long trousers that are ankle length
- Approved hard hats
- Safety spectacles with side shields
- Steel-toe protective footwear
- High visibility vest or other high visibility outer garment when in construction area or other non-office work areas.
- Protective gloves, such as leather to prevent physical trauma or nitrile to prevent chemical exposure, as needed
- Hearing protection as needed.

7.2 Modified Level D Ensemble

Level D ensemble will be modified to where there is a potential for dermal (skin) exposure to the chemical contaminants of concern. Modified Level D ensemble will consist of the PPE required for Level D with the addition of the following:

- Chemical-resistant overalls (Tyvek or Tyvek QC)
- Inner gloves: Best Safety N-DEX or equivalent
- Outer gloves: Ansell-Edmont SOL-VEX (Nitrile) or equivalent
- Protective cover boots

7.3 Level C Ensemble

Level C ensemble will be used where air monitoring will be performed in the worker's breathing zone indicates a sustained (15 minutes) airborne concentrations of VOC at or above 5 ppm or particulates concentrations in excess of 1.0 mg/m^3 or more above background (See Section 6.0). Level C ensemble may incorporate the Modified Level D protection or may be used with Level D protection if a dermal hazard is not present. Level C specification is as follows:

- Half-mask air-purifying respirator with combination organic vapor cartridges /P-100 dust filter
- Cartridge change out after daily use or immediately if breakthrough is perceived.

7.4 Respiratory Protection

All employees who are expected to don respiratory protection must have successfully passed a qualitative or quantitative fit-test within the past year for the brand, model and size respirator they plan to don. Respirators will be used in accordance with manufacture instructions, and should be thoroughly cleaned using disinfectant material within one week following use.

7.5 Inspection of PPE

Prior to donning PPE must be inspected, for damage or defects. Promptly remove any protective clothing that becomes ripped or torn during a particular task.

7.6 Other Safety Equipment

The following additional safety items should be available at the site:

- Eyewash
  - When work does not involve chemicals - Sealed portable, hand-held eyewash bottles
  - When work involves chemicals - An Ansi Z358.1-1998 compliant station capable of providing at least a 15 minute unbroken stream.
- First aid kit / Blood borne Pathogen Response kit
- 2 A 10 BC multi-purpose dry chemical fire extinguisher (4.5 pounds).
- Hearing protection with a minimum noise reduction ration (NRR) of 27
- Portable phones

8.0 Site Control

8.1 Designation of Zones

Clearly defined control zones will be established when working in areas where MGP-impacts may be present. To prevent both exposure of unprotected personnel and migration of contamination due to tracking by personnel or equipment, these areas will be clearly identified and decontamination procedures (see Section 9.0) will be required for personnel and equipment leaving those areas.

8.1.1 Exclusion Zone

The exclusion zone (EZ) as established by the remediation contractor must be established around the work area or temporary stockpile areas were contamination is present or suspected. The perimeter of the exclusion zone must be clearly identified with traffic cones, protective tape, temporary construction fencing, or other similar devices so that employees and visitors (i.e. municipal inspectors, etc.) are aware of the work being conducted.

8.1.2 Contamination Reduction Zone

The Contaminant Reduction Zone (CRZ) is between the Exclusion and Support Zone (SZ) and provides a location for the removal of PPE which has contacted material with elevated chemical presence, and for decontamination of personnel and equipment. Supplemental safety equipment, such as fire extinguishers, portable eyewash, and extra quantities of PPE may be stored in this area. The Contamination Control Line separating the CRZ and the SZ will be designated with caution tape, or other suitable material. Exit from the EZ will be through a designated decontamination corridor. Personnel assisting with decontamination will wear a level of PPE at or one below that used by personnel in the EZ.

Vehicles, equipment and personnel will exit the exclusion zone through the CRZ before entering the support area. All heavy equipment used in the exclusion zone shall be decontaminated on the decon pad using a pressure washer and soap prior to entering the support zone.

8.1.3 Support Zone

At this site the support zone will include the area outside of the exclusion zone and contamination reduction zone.

8.1.4 Site Access Control

A sign in/out log of personnel, including visitors, who enter the site, will be maintained.

8.1.5 Parking and Staging Areas

Vehicles parked on the public streets will be parked in legal parking spaces.

9.0 Decontamination

All personnel leaving a contaminated area shall be appropriately decontaminated; all contaminated clothing and equipment leaving a contaminated area shall be appropriately disposed of or decontaminated. Decontamination pads should be constructed to capture all decontamination fluid for containment and off-site disposal. Water used for decontamination will be collected and will be tested and appropriately disposed of.

In the CRZ, personnel will remove for disposal their outer protective garments and other consumable items. These items will be placed in drums for off-site disposal at a permitted facility. Non-disposable items such as rubber over boot, and hard hats should be decontaminated by washing them with a soap and water solution and allowed to air dry before bringing them out to the CRZ. The outside of respirators should be initially wiped down with a soap and water solution, followed by a complete cleaning following the manufacturer's recommendations. As an interim measure, clean pre-moisten (non-alcohol) wipe pads can be used to clean the inside of the respirator. Personnel must wash hand and face prior to using tobacco products, eating, drinking or applying cosmetics (sun screen).

9.1 Personal Decontamination

Proper decontamination is required of all personnel before leaving the site. Decontamination will occur within the CRZ.

9.2 PPE Decontamination

Impacted disposable PPE, such as Tyvek coveralls, gloves, etc. will be removed in the decon zone and placed in drums. Final disposal of contaminated PPE is discussed in Section 2.5.

If worn, respirators assigned to an individual will be cleaned after each use with respirator wipe pads and will be stored upright in plastic bags. Respirators will be thoroughly cleaned using disinfectant material within one week following any respirator use.

9.3 Equipment Decontamination

All equipment that has come in contact with contaminated or potentially contaminated material must be decontaminated prior to leaving the site to prevent the exposure and off-site migration of impacted materials. Such equipment may include but is not limited to sampling equipment (shovels, spoons, and buckets), hoses, vehicles, and heavy equipment (backhoes, excavators, and front end loaders).

Employees performing decontamination procedures should wear PPE equivalent to the level of protection required in the EZ.

Decontamination will follow steps:

- In the EZ, remove visible gross contamination using brushes and shovels.
- In the CRZ, wash equipment with a decontamination solution (Alconox®, Simple Green®, or equivalent) with a scrub brush and/or power washer.
- Rinse equipment with water.

All decontamination fluid should be collected in drums.

10.0 Medical Monitoring and Training Requirements

10.1 Medical Monitoring

Subcontractors performing activities in the exclusion and contaminate reduction zone must be active participants in a medical monitoring program that complies with 29 CFR 1910.120(f). Each individual must have completed an annual surveillance examination and/or an initial baseline examination within the last year prior to performing any work on the site covered by this HASP.

10.2 Health and Safety Training

Subcontractors, performing activities covered by this HASP must have completed the appropriate training requirements specified in 29 CFR 1910.120 (e). Each individual must have completed an annual 8-hour refresher training course and/or initial 40-hour training course (and 8-hr supervisor training, if relevant) within the last year prior to performing any work on the sites covered by this HASP.

10.3 Escape Routes and Procedures

Subcontractors must be instructed in the site-specific aspects of emergency evacuation. On-site refresher or update training is required anytime escape routes or procedures are modified or personnel assignments are changed.

Verbal communications will be adequate to warn subcontractors of hazards associated with the immediate work area. Portable phones should be brought to the site to ensure that communications with local emergency responders is maintained, when necessary.

Emergency evacuation routes will be designated at the site, prior to initiating field activities. As field activities progress, it will be necessary to modify the evacuation routes, in accordance with site conditions and layout. Evacuation routes must be clear of obstructions. Typically evacuation routes will be toward the designated muster point. Depending on the location of the site activities at the time of the emergency, this muster point may be adjusted as the site work progresses to the site personnel during the daily tailgate safety meeting The escape route from the site and an emergency muster point will be determined and provided to all workers during the work mobilization and will be discussed during the pre-entry briefing.

10.4 Rescue and Medical Duty Assignments

The phone numbers of the police and fire departments, ambulance service and local hospital are provided in the emergency reference sheet. In the event an injury or illness requires more than first aid treatment, the SSO will designate a subcontractor to accompany the injured person to the medical facility and will remain with the person until release or admittance is determined.

10.4.1 Emergency Contacts

Emergency Coordinators / Key Personnel			
Name	**Title**	**Telephone Number**	**Cellular Phone**
	Property Owner		
	Project Manager		
	Project Engineer		
	Site Health & Safety Manager		

Organization / Agency	
Name	**Telephone Number**
Police Department	911
Fire Department	911
State Police	911
Ambulance Service ***(EMT will determine appropriate hospital for treatment)***	911
Poison Control Center	800-222-1222
National Response Center	800-424-8802
Dig Safe NY	811
Con Edison Bronx/Westchester Control Desk	914-925-6219
Con Edison OCCS Desk	718-204-4100.

10.4.2 Route to Hospital

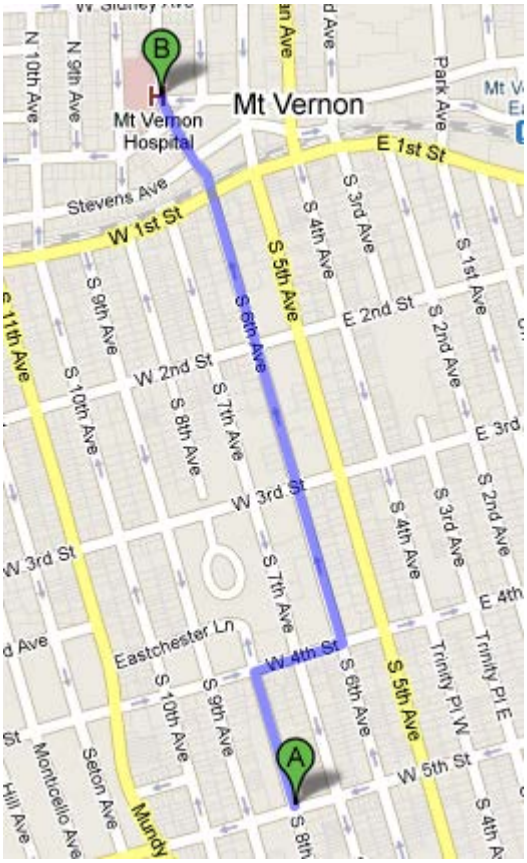
Mount Vernon Hospital
12 North Seventh Ave
Mount Vernon, NY 10550
914-664-8000

Route to Hospital from the intersection of South 8th Ave and West 5th Street
Travel distance to hospital 0.9 miles. Travel time 3 minutes.

A S 8th Ave

1.	Head **north** on **S 8th Ave** toward **W 4th St**	0.2 mi
2.	Take the 1st **right** onto **W 4th St**	0.1 mi
3.	Turn **left** at the 2nd cross street onto **S 6th Ave**	0.5 mi
4.	Continue onto **Wilson Pl**	233 ft
5.	Continue onto **W Roosevelt Square**	259 ft
6.	Continue onto **N 7th Ave** Destination will be on the left	167 ft

B 12 N 7th Ave
Mt Vernon, NY 10550



ATTACHMENT A

Health and Safety Plan Sign-off Sheet

Health and Safety Plan Sign-off Sheet

Environmental Oversight of Remedy Implementation

Consolidated Edison Co. of New York, Inc.

Mount Vernon, New York

I have received a verbal site specific HASP review for the above-referenced site. I have been informed of the location/availability of the HASP, Material Safety Data Sheets and Emergency Equipment. During the orientation I was given an opportunity to ask questions.

Name	Signature	Company	Date

ATTACHMENT B

Job Safety Analysis

JSA Type: ☐ Investigation ☐ O&M ☐Office ☐ Construction	☐ New ☐ Revised	**Date**:
Work Activity:		
Personal Protective Equipment (PPE):		

Development Team	Position/Title	Reviewed By	Position/Title	Date

❶ Job Steps[1]	❷ Potential Hazards[2]	❸ Critical Actions[3]	Work Reevaluation Criteria
		•	•
		•	•
		•	•
		•	•
		•	•

ATTACHMENT C

Pre-Entry Briefing Attendance Sheet

HEALTH AND SAFETY PLAN PRE-ENTRY BRIEFING ATTENDANCE FORM

Environmental Oversight of Remedy Implementation

Consolidated Edison Co. of New York, Inc.

Mount Vernon, New York

Briefing Conducted By: _____

Date Performed: _____

Topics Discussed including work to be performed today:

_____

_____

_____

_____

Printed Name	Signature	Representing

Appendix E.2

Generic Community Air Monitoring Plan

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

Overview

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

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

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

Community Air Monitoring Plan

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

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

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

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

VOC Monitoring, Response Levels, and Actions

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

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

2. If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

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

4. All 15-minute readings must be recorded and be available for State (DEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

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

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

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

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

December 2009

Appendix F

Site-Wide and Annual Inspection Form

Annual Inspection Checklist and Certification
Mount Vernon Former Manufactured Gas Plant Site
Mount Vernon, New York

Inspection Task	Condition		Comments: Describe Conditon, Location and Type of Any Defficeincies, Corrective Actions	Date Completed	Initials
COMPOSITE COVER SYSTEM					
103 West 5th St., 342/346/350 South 8th Ave., 106 West 5th St., 403/407 South 9th Ave., and 359 South 9th Ave. - (Figure 2-4)					
Required Forms Up to Date	Yes ☐	No ☐			
Vegetation	Complete ☐	Locally Degraded ☐			
Any Changes in Cover Type	Yes ☐	No ☐			
New Penetrations	Yes ☐	No ☐			
Any Changes in Property Usage	Yes ☐	No ☐			
SUB-SLAB DEPRESSURIZATION SYSTEM					
103 West 5th Street. - (Figure 2-2)					
*Complete Routine Monitoirng Form in SMP Appendix H SSDS O&M Plan					
Required Forms Up to Date	Yes ☐	No ☐			
Any Deficiencies Identified	Yes ☐	No ☐			
Has the System Been Modified	Yes ☐	No ☐			
System Operating as Designed	Yes ☐	No ☐			
SUB-SLAB DEPRESSURIZATION SYSTEM					
346/350 South 8th Avenue - (Figure 2-2)					
*Complete Routine Monitoirng Form in SMP Appendix H SSDS O&M Plan					
Required Forms Up to Date	Yes ☐	No ☐			
Any Deficiencies Identified	Yes ☐	No ☐			
Has the System Been Modified	Yes ☐	No ☐			
System Operating as Designed	Yes ☐	No ☐			
GROUNDWATER SUMP VENT SYSTEM					
411 South 8th Avenue - (Figure 2-2)					
*Complete Routine Monitoirng Form in SMP Appendix H SSDS O&M Plan					
Required Forms Up to Date	Yes ☐	No ☐			
Any Deficiencies Identified	Yes ☐	No ☐			
Has the System Been Modified	Yes ☐	No ☐			
System Operating as Designed	Yes ☐	No ☐			

Annual Inspection Checklist and Certification
Mount Vernon Former Manufactured Gas Plant Site
Mount Vernon, New York

Inspection Task	Condition				Comments: Describe Conditon, Location and Type of Any Defficeincies, Corrective Actions	Date Completed	Initials
OXYGEN INJECTION SYSTEM							
411 South 8th Avenue - (Figures 2-2 and 2-3)							
*Complete Routine Monitoirng Form in SMP Appendix I Oxygen Injection System O&M Plan							
Required Forms Up to Date	Yes	☐	No	☐			
Any Deficiencies Identified	Yes	☐	No	☐			
Has the System Been Modified	Yes	☐	No	☐			
System Operating as Designed	Yes	☐	No	☐			

Signature/Date: _____

Name: _____

Appendix G

Monitoring Well Boring and Construction Logs

RETEC
2550 Eisenhower Avenue
Eagleville, Pennsylvania 19403

Well ID: MW-2

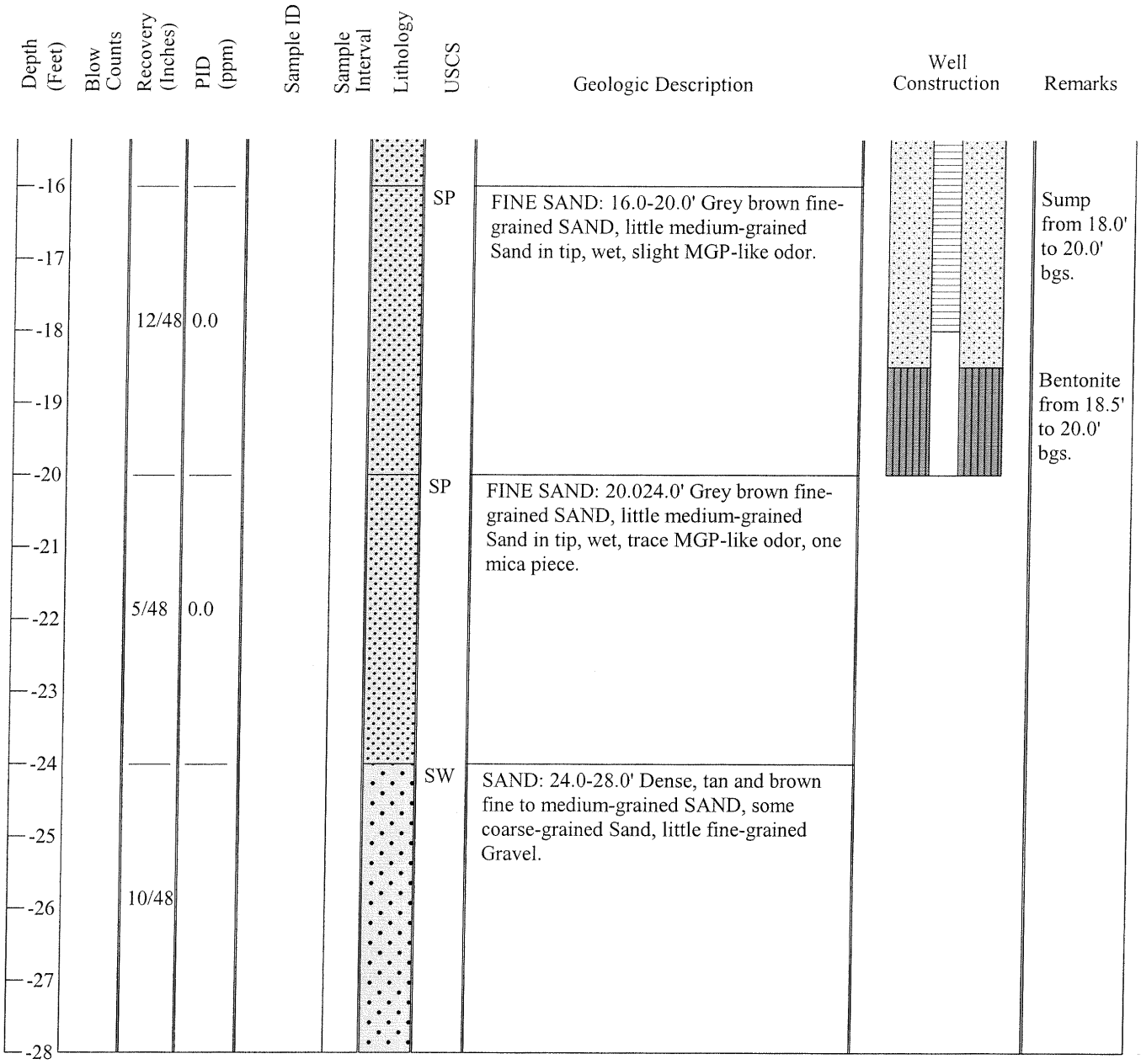
Project Name:	Con Edison Mt. Vernon- MGP	**Boring Location:**	Sidewalk west side of South 8th Ave.
Location:	Mt. Vernon	**PVC Elevation (ft/NAVD 88):**	122.00
Project Number:	CECN5-16579-200	**Total Depth (ft):**	28.0' bgs
Date Started:	8/6/03	**Boring Diameter Outer/Inner (in):**	7.875"/4.25"
Date Finished:	8/6/03	**Water Level During Drilling (ft/bgs):**	12' bgs
Drilling Company:	EPI	**Logged By:**	Josh Millard
Drilling Method:	Geoprobe/ Hollow Stem Auger		
Sampling Method:	Macrocore		

Depth (Feet)	Blow Counts	Recovery (Inches)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Well Construction	Remarks
0								CONCRETE: 0.0-0.5' Concrete.		Concrete and road flush vault from 0.0' to 1.0' bgs.
-1							SW	SAND: 0.5-1.0' Light brown medium to coarse-grained SAND, some fine-grained Sand and fine to coarse-grained Gravel subrounded to subangular, damp.		
-2			0.0				SW	SAND: 1.0-2.0' Brow medium to coarse-grained SAND, some fine-grained Sand and fine to coarse-grained Gravel subangular, little Silt, trace Cobbles and mica flakes, moist, at 1.5' bricks starting to appear.		Grout from 1.0' to 4.0' bgs.
-3										
-4							SW	SAND: 2.0-3.5' Light brown medium to coarse-grained SAND, some to little fine to medium-grained Gravel, trace Cobbles, wet, at 3.5' bgs few pieces of wood.		Bentonite seal from 4.0' to 6.0' bgs.
-5										
-6		21/48	0.0				SW	SAND: 3.5-5.0' Light brown to brown, medium to coarse-grained SAND, some fine-grained Sand and Silt, little fine to coarse-grained Gravel rounded to subangular, trace Cobble, damp to wet.		Sand pack from 6.0' to 18.5' bgs.
-7										
-8							SW	SAND: 5.0-8.0' Mottled brown and reddish brown fine to medium-grained SAND, little fine-grained Gravel.		
-9										
-10		21/48	0.0					SAND: 8.0-12.0' Tight layered grey brown and red brown fine-grained SAND and fine to medium-grained SAND Lenses, trace fine-grained Gravel, trace black staining in tip, damp, slight odor.		2-inch Schedule 40 PVC riser from 0.0' to 8.0' bgs.
-11										
-12							SP	FINE SAND: 12.0-12.3' Dark grey fine-grained SAND, saturated, moderate to strong MGP-like odors, trace sheen, some sheen? on macrocore.		2-inch diameter 0.020 slot PVC screen from 8.0' to 18.0' bgs.
-13			19.6				SP			
-14		16/48						FINE SAND: 12.3-16.0' Grey brown fine-grained SAND, no staining, little sheen, moderate odor.		
-15			8.5							

Notes: Stopped at 28.0' bgs because soil was clean. Sampled withdirect push geoprobe, hole collapsed in on its self.

RETEC
2550 Eisenhower Avenue
Eagleville, Pennsylvania 19403

Well ID: MW-2



Notes: Stopped at 28.0' bgs because soil was clean. Sampled withdirect push geoprobe, hole collapsed in on its self.

RETEC
2550 Eisenhower Avenue
Eagleville, Pennsylvania 19403

Well ID: MW-4

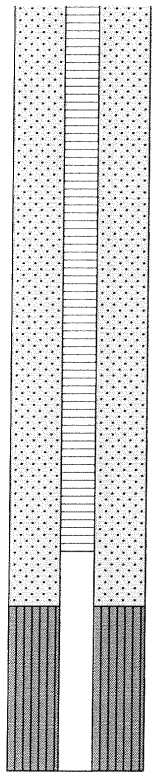
Project Name:	Con Edison Mt. Vernon- MGP	**Boring Location:**	Corner of S 8th Ave and W 5th St.
Location:	Mt. Vernon	**PVC Elevation (ft/NAVD 88):**	120.10
Project Number:	CECN5-16579-200	**Total Depth (ft):**	23.5' bgs
Date Started:	8/6/03	**Boring Diameter Outer/Inner (in):**	7.875"/4.25"
Date Finished:	8/6/03	**Water Level During Drilling (ft/bgs):**	10' bgs
Drilling Company:	EPI	**Logged By:**	J. Millard
Drilling Method:	Geoprobe/ Hollow Stem Auger		
Sampling Method:	Macrocore		

Depth (Feet)	Blow Counts	Recovery (Inches)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Well Construction	Remarks
0							SC	SILT, SAND, CLAY: 0.0-0.6' bgs- Topsoil.		Concrete and flushed mounted road box from 0.0' to 1.0' bgs.
-1							GP	GRAVELLY SAND: 0.6-3.0' bgs- GRAVELLY SAND, asphaltic materials, some brick.		
-2	NA	NA	1.3							
-3							GP	GRAVEL AND SAND: 3.0-3.5' bgs- Dark brown medium to coarse-grained SAND and GRAVEL, some Cobbles.		Grout from 1.0' to 3.0' bgs.
-4							SW	SAND: 3.5-5.0' bgs- Dark brown medium to coarse-grained SAND, little fines and brick.		Bentonite seal from 3.0' to 5.0' bgs.
-5							GP	GRAVEL AND SAND: 5.0-6.0' bgs- Medium brown SAND and GRAVEL, trace crushed brick, dry.		
-6	NA	14/48	4.0				SW	SAND: 6.0-8.0' bgs- Loose, light brown fine to medium-grained SAND, little coarse-grained Sand, damp.		Sand pack from 5.0' to 17.5' bgs.
-7										
-8							SW	SAND: 8.0-10.0' bgs- Loose, light brown fine to medium-grained SAND, little coarse-grained Sand, damp.		2-inch diameter Schedule 40 PVC riser from 0.0' to 7.0' bgs.
-9										
-10	NA	21/48	171				SP	FINE SAND: 10.0-12.0' bgs- Soft, brown fine-grained SAND, trace coarse-grained Sand, saturated, dark brown staining, heavy sheen, strong MGP-like odor, slight NAPL smearing on sleave of macrocore, spotty residual NAPL on bottom.		
-11										
-12										

Notes: Boring excavated from 0' to 5' bgs by hand digging on 7/31/03. Soil descriptions included under geologic descriptions. Geoprobe refusal at 23.5' bgs.

RETEC
2550 Eisenhower Avenue
Eagleville, Pennsylvania 19403

Well ID: MW-4

Depth (Feet)	Blow Counts	Recovery (Inches)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Well Construction	Remarks
-13							SP	FINE SAND: 12.0-14.0' bgs- Soft, brown fine-grained SAND, trace coarse-grained Sand, saturated, dark brown staining, heavy sheen, strong MGP-like odor, slight NAPL smearing on sleave of macrocore, spotty residual NAPL on, few small NAPL blebs on water in macrocore.		2-inch diameter 0.020 slot PVC screen from 7.0' to 17.0' bgs.
-14	NA	~8/48	25				SP	FINE SAND: 14.0-15.0' bgs- Soft, greenish grey brown fine-grained SAND, thin residual NAPL band on bottom, wet.		
-15							SW	SAND: 15.0-16.0' bgs- Iron stained fine to medium-grained SAND, no black staining, no NAPL.		
-16							SP	FINE SAND: 16.0-20.0' bgs- Orange and brown fine-grained SAND, light to MGP-like odor, wet.		2-inch diameter PVC sump from 17.0' to 19.0' bgs.
-17										
-18	NA	3/48	10.2							Bentonite from 17.5' to 19.0' bgs.
-19										
-20							SP	FINE SAND: 20.0-23.5' bgs- Orange and brown fine-grained SAND, wet.		
-21										
-22	NA	2/42	1.2							
-23										

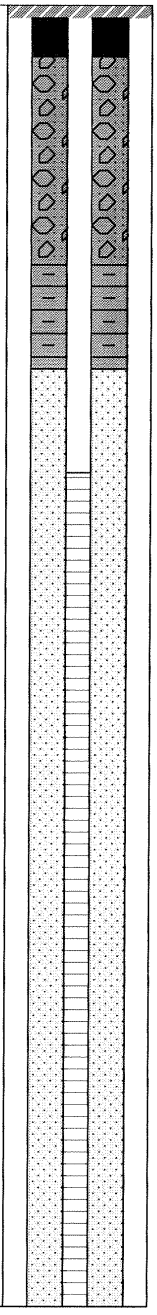
Notes: Boring excavated from 0' to 5' bgs by hand digging on 7/31/03. Soil descriptions included under geologic descriptions. Geoprobe refusal at 23.5' bgs.

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: MW-6

Project Name:	Mt. Vernon, NY	**Drilling Method:**	Direct Push/GeoProbe
Project Number:	CECN5-16579	**Sampling Method:**	5 ft Macrocore
Date Started:	December 1, 2004	**Ground Elevation (ft/msl):**	120.30' NAVD 88
Date Finished:	December 1, 2004	**Total Depth (ft):**	25 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard

Depth (Feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Remarks	Well Construction
0			0				Con-crete	Concrete.	Flush mounted road box.	
-1			0				Fill	SAND. Grayish brown fine SAND, some gravel; loose. Ash-like material and construction/demolition material.	Grout from 1-5 ft bgs.	
-2	NA	5.0								
-3			0							
-4								With grayish-brown SAND, some silt.	Bentonite seal from 5-7 ft bgs.	
-5			0					Gray CLAY, some ash-like material.		
-6			0.9						Sand pack from 7-25 ft bgs.	
-7	NA	2.8					SP	Reddish-brown fine-medium SAND and fine-medium gravel, some mica; dry.		
-8										
-9			3.0							
-10								Black fine-coarse SAND, little fine gravel; wet.		
-11			5.7							
-12	NA	2.7						Grayish brown fine SAND; soft, wet.		
-13			2.1						2" diameter, 0.020 Slot PVC screen from 9-25 ft bgs.	
-14										
-15							Till			
-16			65.6	MW-6 (15-17.5)				Gray SAND and gravel; dense, wet, moderate MGP-like odor, little/trace black staining. Residual NAPL and light sheen from 15-16 ft bgs.		
-17	NA	1.8								
-18										
-19			2.4					Gray SAND, silt and gravel; moist.		
-20										
-21								Brown and gray fine-coarse SAND, some fine gravel; moderate to strong MGP-like odor and sheen, NAPL blebs.		
-22			28.7							
-23	NA	4.0		MW-6 (20-25)				Gray very fine SAND, some coarse sand and gravel; very dense, trace odor.		
-24			7.3					Boring terminated at 25 ft bgs.		
-25										



Remarks: Samples MW-6(15-17.5) and MW-6(20-25) analyzed for MGP suite compounds.
Boring pre-cleared November 11, 2004 via vactron and airknife from 0-5 ft bgs.
bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: MW-7

Project Name:	Mount Vernon, New York	**Drilling Method:**	Hollow-Stem Auger
Project Number:	CECN5-16579	**Sampling Method:**	Split Spoon
Date Started:	November 2, 2004	**Ground Elevation (ft/msl):**	120.74' NAVD 88
Date Finished:	November 2, 2004	**Total Depth (ft):**	28 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard

Depth (Feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Remarks	Well Construction
0			0.9				Black-top	Asphalt/Gravel base.	Flush mounted road box.	
-1			3.0				Fill	Dark grayish-brown GRAVEL, some sand; firm, dry.		
-2	NA	5.0	2.1					Dark grayish-brown SAND, some gravel; firm, dry.	Grout from 1-3 ft bgs.	
-3			10.4					Slag and ash-like material at 3-3.5 ft bgs.	Bentonite seal from 3-5 ft bgs.	
-4			5.9				SM	Yellowish-brown fine SAND, some clay; dry.		
-5	6							Yellowish-brown fine SAND, some silt, little clay; dry.		
-6	24 40	0.7	1.2				SP	Dark brown fine SAND, little gravel; dense, dry.	Sand pack from 5-19 ft bgs.	
-7	34 26									
-8	22 25	0.8	1.7					Grayish-brown and reddish-brown fine SAND, little gravel.		
-9	20 14									
-10	11 11	0.8	3.1	MW-7 (9-11)			SW	Dark brown fine SAND and mica; moderately dense, wet, MGP-like odor.		
-11	10 9							Brown medium-fine SAND, little mica; wet.		
-12	10 10	0.7	0.8						2" diameter, 0.020 Slot PVC screen from 7-17 ft bgs.	
-13	12 3							Brown fine-medium SAND, little mica; loose, wet.		
-14	8 12	1.2	0.7					Brown fine SAND, little fines and mica; loose, wet.		
-15	25 4							Brown fine SAND, little mica; loose, wet.		
-16	5 7	1.8	0.9					Brown fine SAND; loose, wet.		

Remarks: (1) Sample MW-7 (9-11) and MW-7 (27-29) analyzed for MGP suite compounds.

(2) Boring pre-cleared October 26, 2004 via vactron and airknife from 0-5 ft bgs.

bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: MW-7

Depth (Feet)	Blow Counts	Recovery (feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Well Construction	Remarks
-17	9							Brown medium SAND; loose, wet.	Well sump from 17-19 ft bgs.	
-18	8 5 5	0.9	0.0					Brown fine SAND, little fines; loose, wet.		
-19	5							Brown medium SAND; loose, wet.		
-20	3 3 4	1.3	0.0							
-21	6									
-22	8 16 19	1.4	0.0				Till	Brown fine SAND; moderately dense, wet.		
-23	21									
-24	5 8 9	0.8	0.0					Brown fine SAND; loose, wet.		
-25	20							Brown medium-fine SAND; moderately dense, wet.		
-26	5 10 15	1.8	0.0					Brown fine SAND, scattered mica flakes; dense, wet.		
-27	44							Brown fine-medium SAND; dense, wet.		
-28	40 50/4	0.8	0.0	MW7 (27-28)			Bed-rock	Refusal at 28 ft bgs. Mica schist bedrock at 28 ft bgs.		

Remarks: (1) Sample MW-7 (9-11) and MW-7 (27-29) analyzed for MGP suite compounds.

(2) Boring pre-cleared October 26, 2004 via vactron and airknife from 0-5 ft bgs.

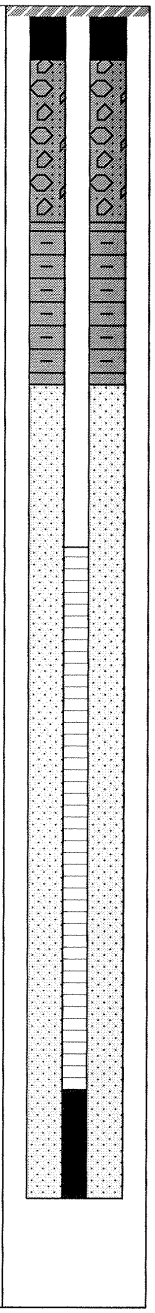
bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: MW-10

Project Name:	Mt. Vernon, New York	**Drilling Method:**	Direct Push/GeoProbe
Project Number:	CECN5-16579	**Sampling Method:**	5 ft Macrocore
Date Started:	November 22, 2004	**Ground Elevation (ft/msl):**	121.88 ft NAVD 88
Date Finished:	November 23, 2004	**Total Depth (ft):**	24 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard

Depth (Feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Remarks
0									Flush mounted road box.
-1			0				Fill	Dark brown poorly sorted SAND, some clay; dry.	
-2			0					Light brown poorly sorted SAND, some clay, and slag and brick fragments; dry.	Grout from 1-4 ft bgs.
-3	NA	5.0	0					Some ash-like material from 2-3 ft bgs.	
-4			0				ML	Light gray and yellowish-brown SILT, some sand; soft.	
-5			0					Reddish brown SILT, some sand; firm to soft.	Bentonite seal from 4-7 ft bgs.
-6							SP	Grayish brown fine SAND, some medium-fine gravel and mica, little silt; dense, dry.	
-7	NA	5.0	1.2						
-8									Sand pack from 7-22 ft bgs.
-9									
-10									
-11			4.4					Brownish-gray fine-medium SAND, some gravel, little silt; dense, wet.	
-12	NA	3.3		MW-10 (12-15)					
-13									
-14			1.2						
-15							Till	Light gray fine-medium SAND, some fine rounded gravel; dense, wet.	2" diameter, 0.020 Slot PVC screen from 10-20 ft bgs.
-16			2.9						
-17	NA	4.0							
-18									
-19			2.0						
-20									Well sump from 20-22 ft bgs.
-21			45	MW-10 (20-23)					
-22	NA	3.5							
-23			6					Crushed schist in tip of Macrocore.	
-24			2.3				Bed-rock	Mica schist bedrock at 24 ft bgs.	



Remarks: (1) Sample MW-10(12-15) and MW-10(20-23) analyzed for MGP suite compounds.

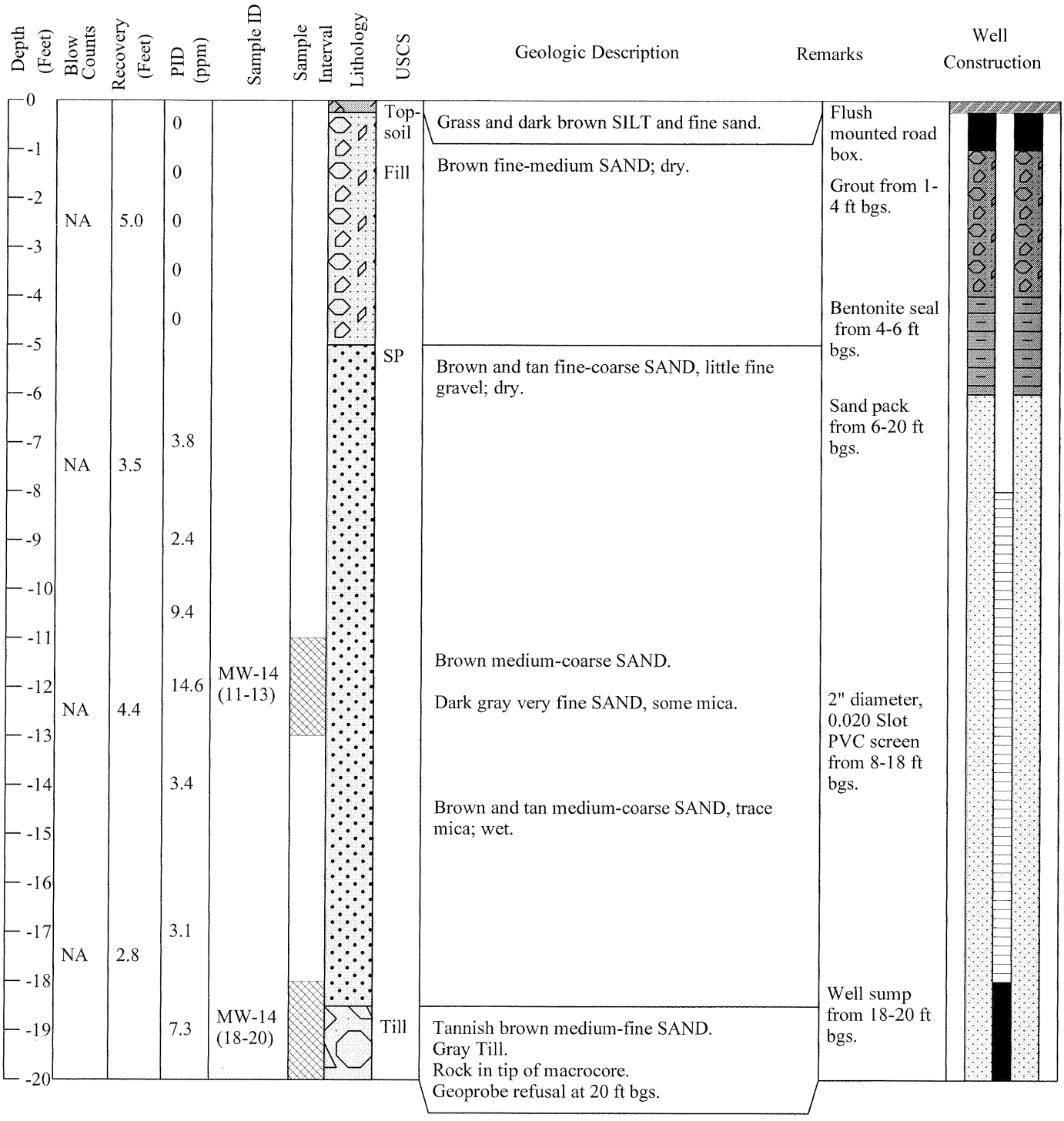
(2) Boring pre-cleared October 26, 2004 via vactron and airknife from 0-5 ft bgs.

bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: MW-14

Project Name:	Mt. Vernon, New York	**Drilling Method:**	Direct Push/HGeoprobe
Project Number:	CECN5-16579	**Sampling Method:**	5 ft Macrocore
Date Started:	December 16, 2004	**Ground Elevation (ft/msl):**	121.84 ft NAVD 88
Date Finished:	December 16, 2004	**Total Depth (ft):**	20 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard



Remarks: 1) Samples MW-14(11-13) and MW-14(18-20) analyzed for MGP suite compounds.

bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: SB-30/MW-15

Project Name:	Mt. Vernon, NY	**Drilling Method:**	Hollow-Stem Auger
Project Number:	CECN5-16579	**Sampling Method:**	2 ft Split Spoon
Date Started:	November 4, 2004	**Ground Elevation (ft/msl):**	
Date Finished:	November 4, 2004	**Total Depth (ft):**	28.5 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard

Depth (Feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Remarks	Well Construction
0									Flush-mounted well cap.	
-1			1.2				Fill	Asphalt/gravel base.		
-2	NA	5.0/ 5.0	0.8 32					Brown SILT, some sand and gravel, little brick fragments; dry.	Sand pack from 1-2 ft bgs. Bentonite seal from 2-7 ft bgs.	
-3			27.9							
-4			33.6							
-5	2						SM	Dark brown SILT, some sand; loose, dry.		
-6	5 11 33	1.1	1.1					Light gray CLAY; firm, dry, some iron staining. Light brown medium-fine SAND, some gravel and rock fragments; firm, dry.		
-7	27							Dark brown SILT and sand; dry.		
-8	9 6 9	0.8	1.0					Light brown CLAY and silt; soft, dry. Light brown and white quartz cobble. Dark brown SILT and clay; soft, dry.	Sand pack from 7-21 ft bgs.	
-9	4							Light gray CLAY; dry, iron staining.		
-10	6 19 28	1.2	1.4				SP	Brown fine-medium SAND, some gravel; firm, dry.	2" diameter, 0.020 Slot PVC screen from 9-19 ft bgs.	
-11										
-12	NA	0	NA					Boulder. Becomes wet at 12 ft bgs.		
-13	15									
-14	14 20 45	0.8	1.2	SB-30 (13-15)				Cobble fragments. Brown medium-coarse SAND, some gravel; dense, wet, iron-like staining.		
-15	10									
-16	26 16 31	1.1	1.2					Brown medium-fine SAND, some gravel; dense, wet.		
-17	20									
-18	47 37 42	1.3	0.6				Till	Light gray fine SAND, some gravel and cobbles; dense, wet.		
-19										

Remarks: 1.) Samples SB-30(13-15) and SB-30(23-25) analyzed for MGP suite compounds.

2.) Boring pre-cleared October 22, 2004 via vactron and air knife from 0-5 ft bgs.

bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: SB-30/MW-15

Depth (Feet)	Blow Counts	Recovery (feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Well Construction	Remarks
-20	37 50 50/5	0.8/ 1.4	0.6					Light gray fine SAND, some gravel and cobbles; very dense, wet.	Well sump from 19-21 ft bgs.	
-21										
-22	50 50/4	0.8/ 0.83	0.4							
-23								Very dense.		
-24	50 50/3 21 50	0.8	0.8	SB-30 (23-25)						
-25										
-26	50/4	0.3/ 0.35	NA							
-27										
-28	50/2	0.3/ 0.3	NA				Bed- rock	Mica schist bedrock at 28.5 ft bgs.		

Remarks: 1.) Samples SB-30(13-15) and SB-30(23-25) analyzed for MGP suite compounds.

2.) Boring pre-cleared October 22, 2004 via vactron and air knife from 0-5 ft bgs.

bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: MW-16/SB-90

Project Name:	Mt. Vernon, New York	**Drilling Method:**	GeoProbe/Hollow-Stem Auger
Project Number:	CECN5-16579	**Sampling Method:**	Macrocore
Date Started:	April 25, 2005	**Ground Elevation (ft/msl):**	119.09 ft NAVD 88
Date Finished:	April 25, 2005	**Total Depth (ft):**	19 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard

Depth (Feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Remarks	Well Construction
0							Top-soil	Grass and topsoil.	Flush mounted curb box.	
-1			3.0				Fill	Light brown SAND, silt, and gravel; dry. Broken, weathered concrete from 0.8-1.0 ft bgs.	Grout from 1-4 ft bgs.	
-2	NA	5.0						Light brown SAND, little clay and silt, little/trace gravel, trace slage and roots; dry.		
-3			1.8							
-4									Bentonite seal from 4-6 ft bgs.	
-5								Brown SILT, sand and gravel.		
-6	NA	1.7	3.0				SP	Gray and tan medium SAND, little coarse sand, trace fine gravel.		
-7								Gray and tan medium-coarse SAND.		
-8	NA	1.3	4.7						Sand pack from 6-18 ft bgs.	
-9								Becomes wet at 9.75 ft bgs.		
-10								Gray and tan medium SAND; wet.		
-11	NA	1.2	4.1				SW	Gray-brown fine SAND; wet.		
-12								Gray brown and tan layered fine-medium SAND.	2-inch diameter, 0.020-slot PVC screen from 8-18 ft bgs	
-13	NA	1.2	5.2							
-14										
-15								Gray brown fine-medium SAND; wet.		
-16	NA	1.3	8.2				Till	Broken cobble from 15.5-16.7 ft bgs. Gray brown fine-medium SAND and gravel; dense, wet.		
-17										
-18	NA	1.1	3.6					Very dense from 18.8-19 ft bgs. Piece of quartzite in tip. Geoprobe refusal at 19 ft bgs.		
-19										

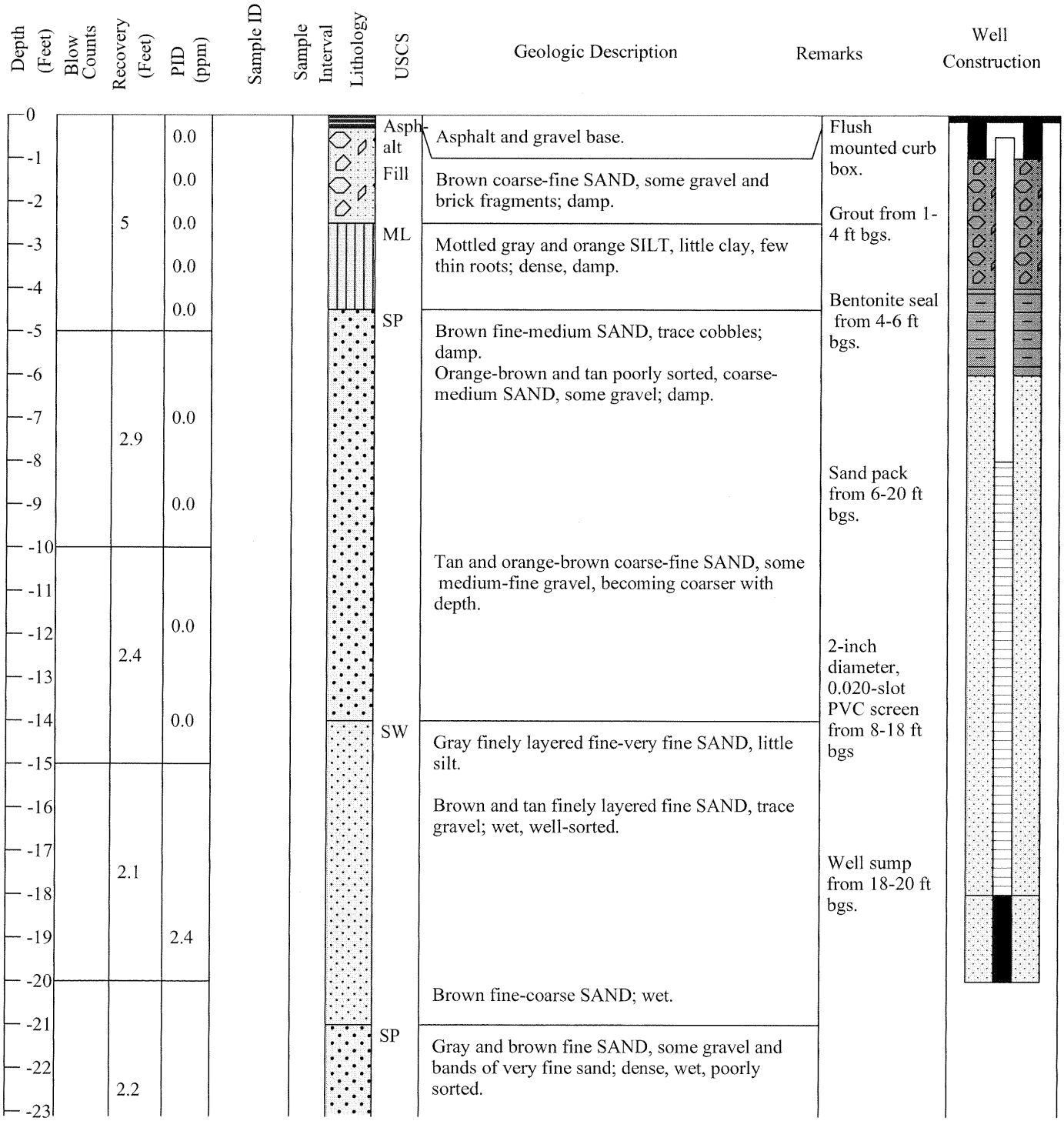
Remarks: Boring pre-cleared on April 22, 2005 from 0-5 ft bgs. Monitornig well installed with geoprobe on May 6, 2005.

bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: SB-86/MW-17

Project Name:	Mt. Vernon, NY	**Drilling Method:**	Direct Push/GeoProbe
Project Number:	CECN5-16579	**Sampling Method:**	5 ft Macrocore
Date Started:	March 9, 2005	**Ground Elevation (ft/msl):**	120.95 ft NAVD 88
Date Finished:	March 9, 2005	**Total Depth (ft):**	28.5 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard



Remarks: Boring pre-cleared on March 2, 2005 from 0-5 ft bgs. Monitoring well installed by hollow stem auger on May 9, 2005.

bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: SB-86/MW-17

Depth (Feet)	Blow Counts	Recovery (feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Well Construction	Remarks
-24			3.0							
-25										
-26		1.4	4.0				Till	Gray fine SAND, some fine gravel; very dense.		
-27								Geoprobe refusal at 28.5 ft bgs.		
-28										

Remarks: Boring pre-cleared on March 2, 2005 from 0-5 ft bgs. Monitoring well installed by hollow stem auger on May 9, 2005.

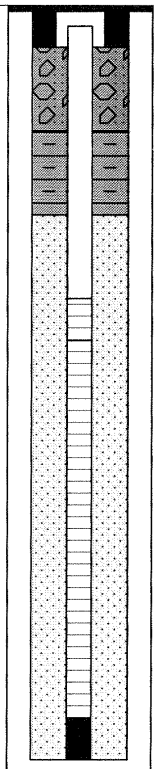
bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: SB-99/MW-18

Project Name:	Mt. Vernon, New York	**Drilling Method:**	Hollow-Stem Auger
Project Number:	CECN5-16579	**Sampling Method:**	Split Spoon
Date Started:	April 26, 2005	**Ground Elevation (ft/msl):**	119.66 ft NAVD 88
Date Finished:	April 26, 2005	**Total Depth (ft):**	31 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard

Depth (Feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Remarks	Well Construction
0							Top-soil	Grass and topsoil.	Flush mounted curb box. Grout from 1-3 ft bgs. Bentonite seal from 3-5 ft bgs.	
-1			4.7				Fill	Moderate to dark brown fine SAND and silt, little fine gravel; dry.		
-2	NA	5.0								
-3			4.0					Gray-brown SILT and clay; dry.		
-4			2.8					Brown and gray SAND, silt, and gravel; damp.		
-5										
-6	NA	2.0	3.2				ML	Brown SILT.		
-7										
-8							SP	Brown and red-brown medium-coarse SAND, some rounded gravel. Becomes wet at 9.5 ft bgs.	Sand pack from 5-18 ft bgs.	
-9	NA	2.5	3.7							
-10										
-11	NA	2.0	3.2				SW	Gray and tan fine SAND, little medium-coarse sand; wet.		
-12										
-13									2-inch diameter, 0.020-slot PVC screen from 7-17 ft bgs	
-14	NA	2.5	5.9					Slight MGP-like odor from 14-15 ft bgs.		
-15										
-16	NA	1.0	3.2				SP	Gray with some black specs, SAND and crushed gravel; dense, wet.		
-17										
-18									Well sump from 17-18 ft bgs.	
-19	NA	2.0	1.6				Till	Gray very fine SAND, little rounded coarse sand and gravel; very dense.		
-20										
-21	NA	2.0	1.6							
-22										
-23										
-24	NA	1.8	1.6							
-25										
-26										
-27	NA	5.0	1.6					Microfractrue of residual NAPL with MGP-like odor at 30.9 ft bgs. Mica schist bedrock in tip. Geoprobe refusal at 31ft bgs.		
-28										
-29										
-30										
-31	NA	1.0	9.6							



Remarks: Boring pre-cleared on April 22, 2005 from 0-5 ft bgs.

Monitoring well installed by hollow stem auger on May, 9, 2005.

bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: SB-89 / MW-19

Project Name:	Mt. Vernon, NY	**Drilling Method:**	Direct Push/GeoProbe
Project Number:	CECN5-16579	**Sampling Method:**	5 ft Macrocore
Date Started:	April 25, 2005	**Ground Elevation (ft/msl):**	118.72 ft NAVD 88
Date Finished:	April 25, 2005	**Total Depth (ft):**	25 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard

Depth (Feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Remarks	Well Construction
0							Top-soil	Grass and topsoil.	Flush mounted curb box.	
-1			4.1				Fill	Dark brown to light brown SAND and gravel, little silt, some large cobbles from 3-5 ft bgs.	Grout from 1-3 ft bgs.	
-2		5.0						Light gray crushed rock; dry.		
-3										
-4			3.0						Bentonite seal from 3-5 ft bgs.	
-5							SP			
-6		1.9	3.7					Light brown fine-medium SAND, some/little fine gravel.		
-7										
-8								Light brown fine-medium SAND and gravel.	Sand pack from 5-17 ft bgs.	
-9		1.2	3.2							
-10								Black medium SAND, little black coarse sand; wet.		
-11		1.4	2.6				Till	Olive-gray fine SAND, some gravel; dense, wet.		
-12										
-13									2-inch diameter, 0.020-slot PVC screen from 7-17 ft bgs	
-14		1.5	2.1					Occasional mica schist gravel.		
-15										
-16		1.6	2.6							
-17								Gray very fine SAND, little fine gravel; very dense, damp.		
-18									Well sump from 17-19 ft bgs.	
-19		1.3	NR							
-20										
-21										
-22		5.0	NR							
-23								Boring terminated at 25 ft bgs.		
-24										
-25										

Remarks: Boring pre-cleared on April 22, 2005 from 0-5 ft bgs. Monitoring well installed by Geoprobe on May 12, 2005.
NR- not recorded
bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: SB-100B/MW-20

Project Name:	Mt. Vernon, New York	**Drilling Method:**	Direct Push/ GeoProbe
Project Number:	CECN5-16579	**Sampling Method:**	5 ft Macrocore
Date Started:	May 19, 2005	**Ground Elevation (ft/msl):**	120.08 ft NAVD 88
Date Finished:	May 19, 2005	**Total Depth (ft):**	30.35 ft bgs
Drilling Company:	Aquifer Drilling and Testing	**Logged By:**	Joshua Millard

Depth (Feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Remarks	Well Construction
0							Top-soil	Topsoil and grass.	Flush mounted curb box.	
-1							Fill	Brown SAND and gravel. Large piece of concrete at 1.5 ft bgs.		
-2	NA	5.0	NA						Grout from 1-3 ft bgs.	
-3										
-4									Bentonite seal from 3-5 ft bgs.	
-5								Dark brown and orange brown SAND and silt, trace fine gravel; dry.		
-6	NA	2.2	3.2				SP	Tan-brown to orange-brown fine SAND, little coarse sand.		
-7										
-8							GP	Tan and orange-brown SAND and gravel; dry.	Sand pack from 5-18 ft bgs.	
-9	NA	2.0	10							
-10								Brown coarse-medium SAND, some gravel, little fine sand; wet.		
-11	NA	0.8	2.5							
-12									2-inch diameter, 0.020-slot PVC screen from 7-17 ft bgs	
-13										
-14	NA	1.8	1.1							
-15							SM	Gray fine SAND; wet, well-sorted.		
-16	NA	1.4	5.2					Interbedded gray SILT and dark brown to black fine SAND beds (0.2-0.3 ft thick).		
-17										
-18										
-19	NA	1.6	4.0					Gray fine SAND and gravel layer from 18.5-18.7 ft bgs.	Well sump from 19-21 ft bgs.	

Remarks: Boring pre-cleared on May 13, 2005 from 0-5 ft bgs.
Well installed by Geoprobe on May 19, 2005.
bgs- below ground surface

RETEC
1001 W Seneca St, Suite 204
Ithaca, NY 14850

Well ID: SB-100B/MW-20

Depth (Feet)	Blow Counts	Recovery (feet)	PID (ppm)	Sample ID	Sample Interval	Lithology	USCS	Geologic Description	Well Construction	Remarks
-20							SW	Gray fine SAND; finely bedded.		
-21	NA	1.4	1.5				SP	Gray GRAVEL (schist) and fine sand; moderately dense, damp.		
-22								Becomes mainly fine SAND.		
-23								Gray fine SAND, little coarse sand and fine gravel; moderately dense, damp.		
-24	NA	1.5	3.6				Till	Gray very fine SAND, little silt; very dense, dry.		
-25										
-26			11.7							
-27	NA	3.9								
-28										
-29			15.6				Bed-rock	Gray powdered broken rock; dense.		
-30	NA	0.35	6.6					Weathered mica schist bedrock at 30 ft bgs. Geoprobe refusal at 30.35 ft bgs.		

Remarks: Boring pre-cleared on May 13, 2005 from 0-5 ft bgs.

Well installed by Geoprobe on May 19, 2005.

bgs- below ground surface

Appendix H

Sub-Slab Depressurization System and Groundwater Sump Venting System Operation, Maintenance and Monitoring Plan

Operation and Maintenance Protocol
Sub-Slab Depressurization and Groundwater Sump Vent Systems

This document provides recommended operation and maintenance protocol for the Sub-Slab Depressurization System (SSDS) installed at the buildings located at 346/350 South 8th Avenue and 103 West 5th Street and the Groundwater Sump Vent System (GSVS) Installed in the basement of the building at 411 South 8th Avenue, Mount Vernon, New York. This document is to be referenced by the personnel responsible for system inspections and maintenance.

- Inspect the SSDS and GSVS systems on a quarterly basis. The form in Attachment A should be completed during each inspection.
- Check the vacuum readings on the manometer installed in the piping on each system. Reading should indicate there is steady negative pressure and that readings are consistent with previous readings. If readings are not consistent, check the piping for cracks or damage.
- Inspect the SSDS and the GSVS fan covers to verify they are in place and not damaged. This should occur quarterly.
- If any significant reduction in efficiency is noted, the affected components should be repaired or replaced.
- Inspect the seal around the groundwater sump (GSVS) for wear or deterioration that may compromise the air tight seal.
- All observations, adjustments, and service activities should be recorded in a dedicated log for tracking and documenting system performance.

Attachment A

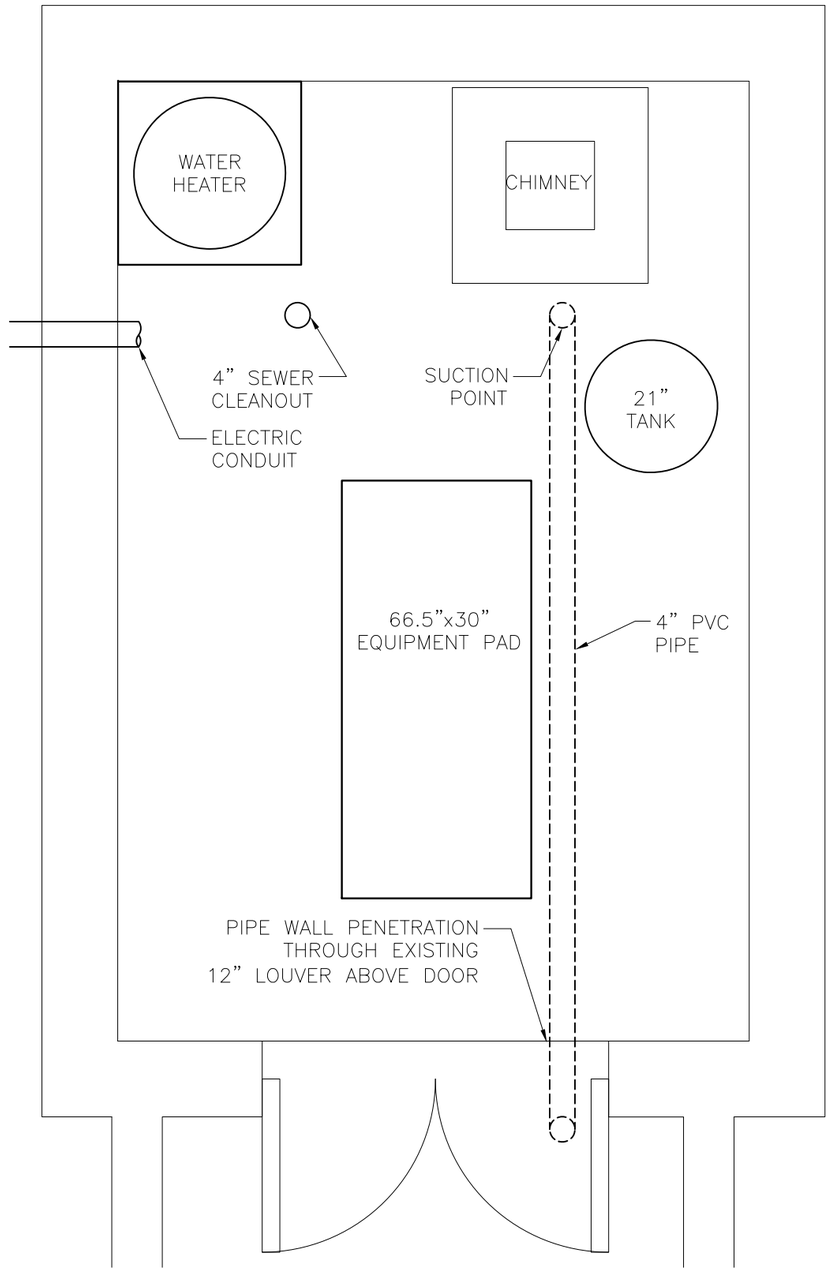
Routine Inspection and Monitoring Checklist
Sub-Slab Depressurization Systems and Groundwater Sump Vent System

Routine Inspection and Monitoring Checklist
Sub-Slab Depressurization Systems and Groundwater Sump Vent System
Con Edison Mount Vernon Former Manufactured Gas Plant Site
Mount Vernon, New York

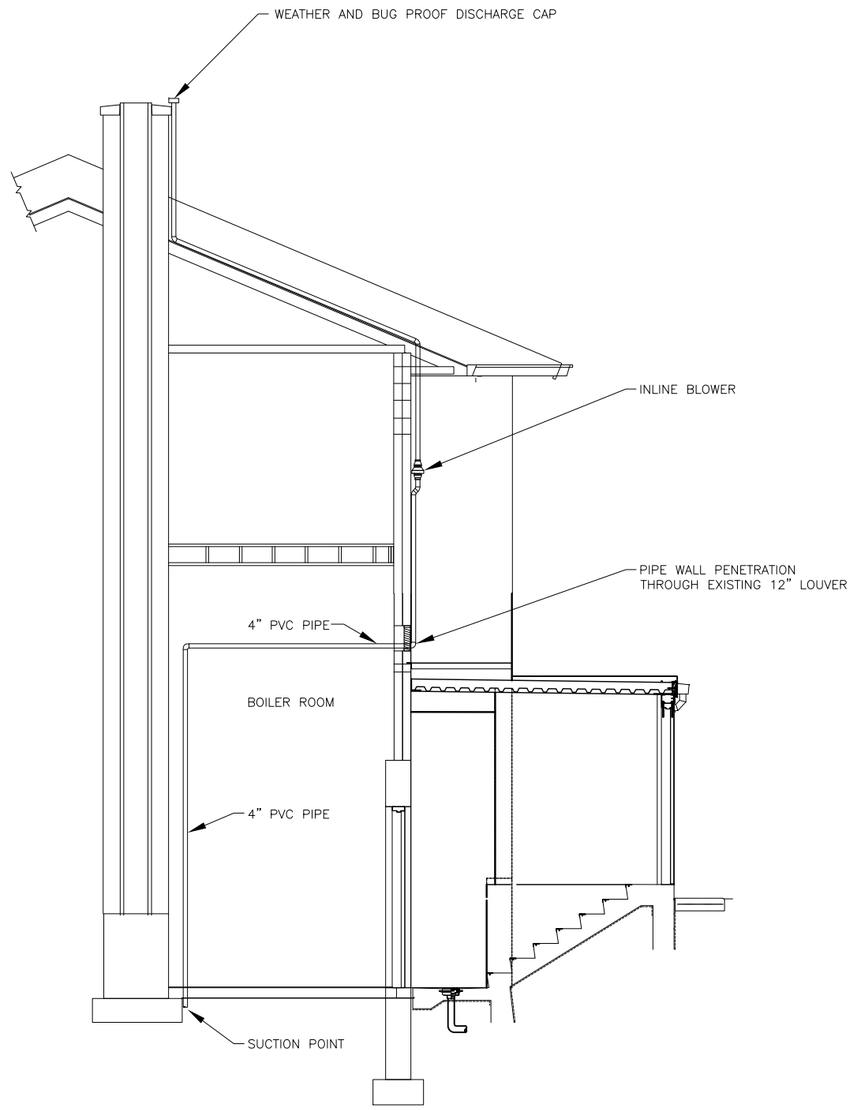
Vapor Extraction System Component	Condition	Yes	No	N/A	Manometer Reading	Condition Description	Corrective Actions Completed
SUB-SLAB DEPRESSURIZATION SYSTEM - 103 WEST 5TH STREET							
Piping and Couplings in the Boiler Room	Holes Cracks or other deficiencies						
Boiler Room Floor Slab	Holes Cracks or other deficiencies						
Fan	Operating Normally						
Manometer	Negative Pressure						
SUB-SLAB DEPRESSURIZATION SYSTEM - 346/350 SOUTH 8TH STREET							
Piping and Couplings in the Boiler Room	Holes Cracks or other deficiencies						
Boiler Room Floor Slab	Holes Cracks or other deficiencies						
Fan	Operating Normally						
Manometer	Negative Pressure						
GROUNDWATER SUMP VENT SYSTEM - 411 SOUTH 8TH AVENUE							
Sump Cover Seal	Holes, tears, or other deficiencies						
Piping and Pipe Couplings	Holes Cracks or other deficiencies						
Fan	Operating Normally						
Manometer	Negative Pressure						

Name of Inspector

Date of Inspection



BOILER ROOM GENERAL EQUIPMENT LAYOUT - TYPICAL
SCALE: APPROXIMATE



3 0 6
GRAPHIC SCALE IN FEET

NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
7							
6							
5							
4							
3							
2							
1							
0	BcV	03/26/12	ISSUED FOR PERMIUT				

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CONSOLIDATED EDISON COMPANY OF NEW YORK
MOUNT VERNON WORKS
MOUNT VERNON, NEW YORK

PROJ. NUMBER: 60164006-300

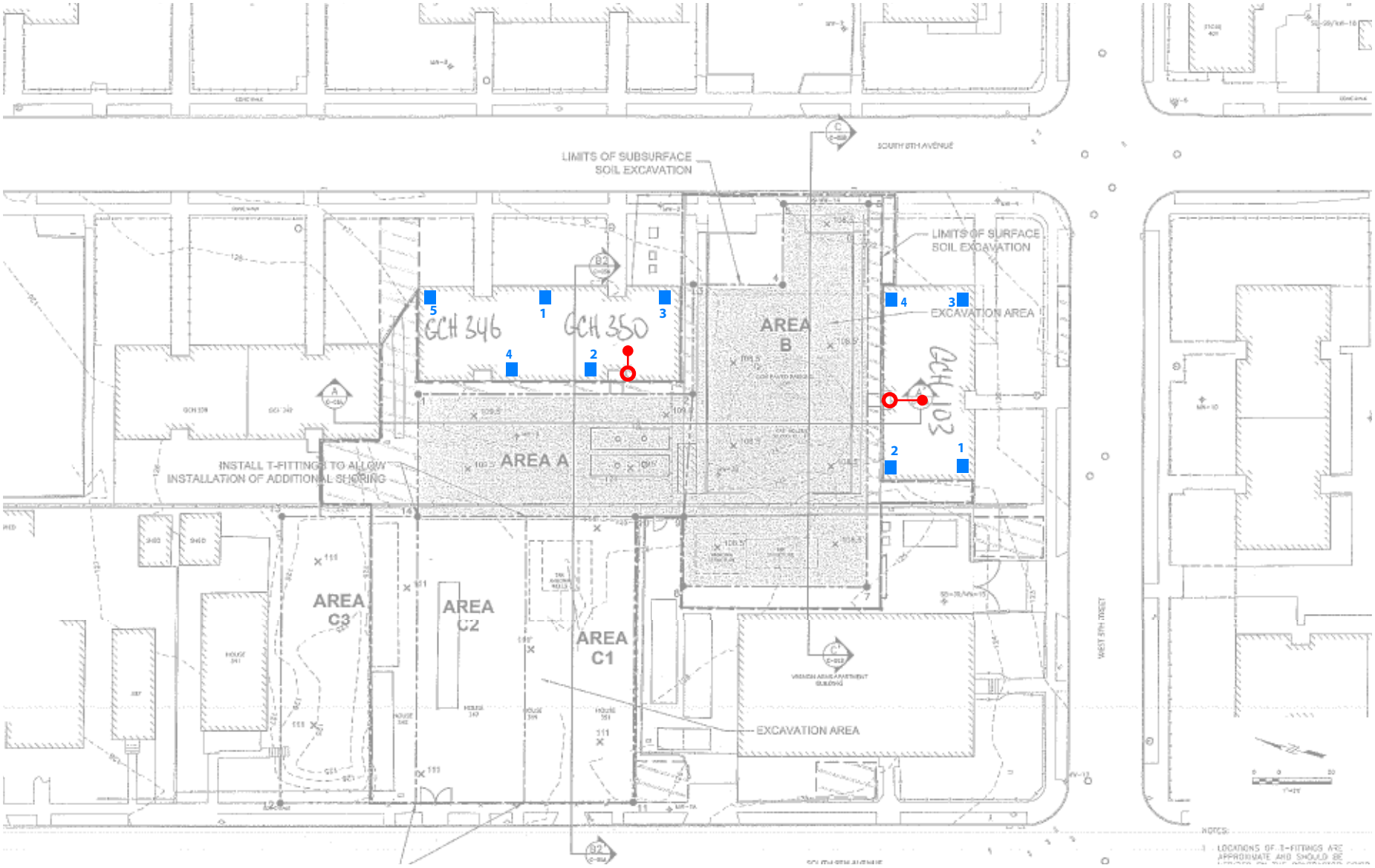
DATE: 04/04/2012

SUBSLAB VENTING SYSTEM

REMEDIAL INVESTIGATION

DRAWING NUMBER: M-1
SHEET NUMBER:
REVISION 0

Ecosystems Strategies, Inc.



Base map based on Site Operation Layout Plan dated 4/19/10. All feature locations are approximate. This map is intended as a schematic to be used in conjunction with the associated report, and it should not be relied upon as a survey for planning or other activities.

Measurement Points Drawing

Mount Vernon Works
City of Mount Vernon
Westchester County, New York

Legend:

- system piping solid 4" schedule 40 PVC, joined with appropriate primer & cement
- fan/riser pipe
- suction point
- sample location

ESI File: CM11161.30
March 2012
Scale as shown
Attachment

Appendix I

Oxygen Injection System Operation, Maintenance and Monitoring Plan

AECOM Environment

Prepared for:
Consolidated Edison, Inc.
Astoria, NY

Prepared by:
AECOM
Chelmsford, MA
60287436.200
August 2013

Operation & Maintenance Manual
Oxygen Injection System
Draft

Mount Vernon Works
Mt Vernon, NY

AECOM Environment

Prepared for:
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Operation & Maintenance Manual
Oxygen Injection System
Draft

Mount Vernon Works
Mt Vernon, NY

_____
Prepared By: Robert McKeever

_____
Reviewed By: Sean Crowell, P.E.

Contents

List of Attachments

1.0 Scope

An oxygen delivery system is being deployed in order to promote biologically-enhanced oxidation of dissolved aromatic hydrocarbon compounds in groundwater as part of the ongoing remediation activities at Mt Vernon former manufactured gas plant (Site) historically operated in Mt Vernon, New York. The enhanced bio-oxidation is a component of the New York State Department of Environmental Conservation (NYSDEC)-approved remedy for the Site.

The oxygen delivery system consists of:

- A metal shed to contain and protect the operational components of the system. The shed is surrounded by a 6-foot high polyvinyl chloride (PVC) fence to provide a measure of security and act a visibility barrier.
- Six 300-size compressed oxygen tanks each with a dedicated gas regulators designed for use with oxygen.
- Manifold system to distribute the oxygen from the tanks to each of 10 groundwater injection wells.
- Polyurethane oxygen-resistant tubing to convey oxygen from the manifold to the injection wells.
- Oxygen injection wells arranged in a linear array perpendicular to the flow of groundwater and the migration direction of dissolved aromatic chemical compounds, which include benzene, toluene, ethylbenzene and xylene (BTEX) and naphthalene.
- An iSOC^{tm} diffusion unit in each well to introduce the oxygen in a metered and consistent manner in order to promote the effective dissolution into the groundwater.
- No electric power is required for this setup.

The Oxygen Injection System Well Layout, Oxygen Diffusion Well Construction Diagram, Process & Instrumentation Diagram and Equipment Layout drawings are provided in Attachment A.

This Manual has been prepared to provide a guide for operating and maintaining the various functional components of the oxygen delivery system. The Manual is intended to serve as the primary reference source for procedures relating to the start-up, routine operation, shutdown, and troubleshooting; requirements for general system maintenance and monitoring; and record keeping protocols.

The Manual should be considered supplementary to the specific and detailed operating, maintenance, and repair procedures furnished by the original equipment manufacturers (OEMs). In specific instances, the OEM procedures are referenced in this Manual for operating, troubleshooting, and preventative maintenance recommendations. Where available, OEM information is included in Attachment B of this manual.

2.0 System Operation and Maintenance

2.1 System Startup and Testing

2.1.1 Initial iSOC Unit Installation

In order to ensure proper installation and operation of the iSOC oxygen infuser units, the procedures outlined below should be followed. Additional instruction details are provided in the manufacturer-provided iSOC Installation Specification Sheet in Attachment B of this Plan.

2.1.2 System Startup

- Ensure all oxygen injection system components (i.e. oxygen tanks, regulators, manifolds, iSOC units, etc) are installed per the iSOC Installation Specification Sheet (Attachment B). It is noted that ***prior to installation of the iSOC units in the injection wells and their submersion into groundwater, it is critical that they are:*** a) connected to the oxygen delivery line from the oxygen injection manifold, and b) that the line and iSOC unit are pressurized with oxygen. After completing these steps submerge the iSOC unit in a bucket of clean water to verify that oxygen is flowing into and through the unit.
- Ensure all valves ahead of the oxygen injection manifold are fully closed before beginning the startup process.
- Fully open the valve located directly on top of each oxygen tank. These valves are designated PR-101 through PR-106 on Drawing M-2 in Attachment A. This is not the regulator valve, which is located on the front of the regulator. Check the tank pressure regulator gauge on each tank (designated PI-101A, PI-102A, PI-103A, PI-104A, PI-105A and PI-106A on Drawing M-2) to verify that each tank is full. The vendor should be contacted to arrange for the prompt replacement of any tanks received with diminished pressure (i.e., indicating that the tank is not full). The tank pressure readings shall be recorded on the System Startup Datasheet (Attachment C).
- At each oxygen tank, set operating pressure in the flexible supply line to 50 pounds per square inch (psi) as indicated the regulator outlet line pressure gauge (PI-101B, PI-102B, PI-103B, PI-104B, PI-105B and PI-106B as shown on Figure 6). The line pressure is adjusted by rotating the main regulator valve on each pressure regulator (PR-101, PR-102, PR-103, PR-104, PR-105 and PR-106) until the desired pressure registers on the corresponding gauge. Turn dial clockwise to increase line pressure and counterclockwise to reduce line pressure. Record the final pressures on the System Startup Datasheet (Attachment C).
- Fully open each ball valve on the oxygen delivery manifold, labeled BV-101, BV-102, BV-103, BV-104, BV-105 and BV-106 and as shown on Figure 6, where the supply line connects to the manifold. The valves should be opened starting at BV-101 and then progressing down the manifold with ball valve BV-106 being opened last.
- The line pressures in each of the tanks should then be rechecked to verify that the line pressures have not changed after all the manifold ball valves have been opened. Adjust as necessary to re-establish the 50 psi line pressure.

- Fully open the ball valve at the end of the tank manifold (BV-200) as shown on Drawing M-1 in Attachment A.
- Proceed to Balancing Oxygen Flow (Section 2.1.3)

2.1.3 Balancing Oxygen Flow (Startup)

- If starting up the system for the first time ensure all ball valves on the oxygen delivery manifold, labeled as BV-201 through BV-210 and as shown on Figure 6 and that the flow meter (rotameter) valves on each injection leg, labeled as FM-201 through FM-210 and as designated on Figure 6 are fully closed before beginning to balance oxygen flow to each well.
- Ensure that that there is no oxygen flow by verifying that flow meters on each injection leg labeled as FM-201, FM-202, FM-203, FM-204, FM-205, FM-206, FM-207, FM-208, FM-209 and FM-210 and as designated on Figure 6. This no-flow verification shall be recorded on System Startup Datasheet as flow reading of zero cubic centimeters per minute (cc/min).
- Open each leg injection manifold ball valve (BV-201, BV-202, BV-203, BV-204, BV-205, BV-206, BV-207, BV-208, BV-209 and BV-210) 100%. The line pressure valves at this time should all read approximately 50 psi, as they would be in equilibrium with the oxygen supply line and pressure.
- Using the flow meter control valves, labeled as FM-201 through FM-210 and as designated on Figure 6, commence balancing the flow across the manifold by manually adjusting each flow meter control valve beginning with the valve FM-01 which controls oxygen flow to injection well IW-0 and progressing sequentially to FM-02 for the leg to injection well IW-1 and continue until flow of oxygen through the flow control valve FM-10 is established and balanced. The design target flow for the system is 10 to 15 cc/min per well. The system will be considered balanced when the flow readings on all flow gauges are within approximately ±1.0 cc/min. Record the final flow readings and changes in the settings on the needle valves on each injection leg on the System Startup Datasheet. Changes in the settings should be established by recording the number of turns clockwise or counterclockwise from the initial setting needed to achieve balance.
- On the System Startup Datasheet, record the final reading from the each injection leg pressure gauge labeled asPI-201, PI-202, PI-203, PI-204, PI-205, PI-206, PI-207, PI-208, PI-209 and PI-210 and as shown on Figure 6.

2.1.4 Oxygen Injection System Checks

During routine O&M events, such as system start-up, tank replacement and periodic inspections, the system components shall be visibly inspected for apparent damage or wear. Testing of oxygen leaks at all tubing connections will also be performed to identify specific leak locations, if any. Any components determined to be faulty shall be replaced and retested. All O&M observations, monitoring results and repairs shall be properly documented as specified in Section 2.6 of this O&M Plan.

Leak checks to be completed at start up, during tank replacement, and quarterly thereafter include the following:

- Test all fittings and connection points for oxygen leaks by applying leak detector solution (liquid soap with water) and inspecting for bubbles.

- If bubbles are observed, indicating a leak, attempt to tighten the fitting using the appropriate hand tools and re-check for leaks with the leak detector solution.
- If the leak persists, isolate that particular leg, whether it's associated with the oxygen supply manifold or the oxygen delivery manifold. Disassemble the faulty joint/connection, re-install it with new seal or Teflon tape or thread sealant and re-test to verify the leak has been corrected. ***Note:*** *If this becomes necessary, isolating the leg may require removal of the iSOC unit so that it is above the water level in the well and does not flood in the event that the line pressure in the leg drops during the repairs.* If this does not correct the leak, replace the connection component and retest to verify the leak has been repaired. Once the leak has been corrected re-activate the leg that was isolated and readjust valve positions (if necessary).

2.2 System Operation: Routine Equipment Maintenance

Routine maintenance activities are those which are performed on a regular basis or in response to normal system conditions.

2.2.1 Replacing Spent Compressed Oxygen Tanks

Notes:

1) To start, oxygen tanks should be replaced ***before*** the tank pressures get below 10 percent of their starting pressure, as indicated on the tank pressure gauge on the regulator. For subsequent replacements, the decision of when to change tanks should be made based on actual use and the period between checks.

2) During replacement, only one tank should be replaced at a time in order to maintain pressure in the oxygen supply manifold, delivery system manifold and the oxygen delivery legs.

- Fully close main valve located directly on top of the oxygen tank being replaced before the pressure regulator.
- Fully close ball valve in the tubing connecting the tank requiring replacement to the cylinder manifold (BV-101, BV-102, BV-103, BV-104, BV-105 or BV-106).
- Disconnect pressure regulator from spent oxygen tank.
- Remove spent oxygen tank and replace it with a new one. During replacement, each tank shall be promptly attached securely to the tank holder and the retainer chain reinstalled.
- Crack open new gas tanks **BEFORE** attaching regulators to purge out any debris such as sand and paint chips. Be sure to do so while wearing proper eye protection and making sure there are no open flames or combustibles in the area. Observe OSHA safety guidelines for handling and securing gas tanks.
- Connect pressure regulator to new oxygen tank.
- Fully open main valve located directly on top of the new oxygen tank. These valves are designated "PR" on the Oxygen Injection System Layout drawing in Attachment A.
- Check and record the pressure in each new tank, as indicated on the tank pressure gauge located on the regulator, immediately following installation of each new tank.
- Fully open ball valve at the end of the feed tubing connecting the new tank to the tank manifold. These valves are designated "BV" on the Oxygen Injection System Layout drawing in Attachment A.

- Check for leaks in all seals, fittings, tubing and piping between the tank and the manifold using a liquid soap/water mixture and looking for air bubbles. If a leak is present, follow procedures outlined in Section 2.1.4.

2.3 System Operation: Non-Routine Equipment Maintenance

Non-routine maintenance activities are performed when unexpected operating conditions are encountered. These include visible damage to the system or anomalous pressure readings in one or more oxygen delivery legs which are not due to identified leaks on those legs.

2.3.1 Checking iSOC Units for Flooding (as required based on operational parameters)

- ***Without*** closing the valve for the affected leg (i.e., without isolating that leg from the rest of the system), carefully remove the iSOC infusion unit from the affected well.
- Submerge iSOC unit in a bucket of clean water. There should be 1-2 visible bubbles coming from the iSOC unit every 1-2 seconds. Verify that any bubbles observed are emanating from the iSOC and not the tubing above.
- Verify that the connection of the tubing to the unit is not leaking (i.e., no bubble are forming at this connection).
- Inspect the tubing and all connections to ensure that there are no kinks and or the tubing is not twisted (i.e., restricting flow). If such conditions are observed, then tubing should be re-aligned to correct the issue and or replaced, as necessary.
- With the unit submerged in the bucket of clean water, verify that the iSOC unit is not flooded by observing that no water is present in the tubing above the top the unit.
- If water is not observed in the tubing above the top of the iSOC unit during the testing, the unit is considered to be not flooded. However, since the unit has already been removed from the unit, the drain plug on the bottom of the unit should be removed and the exposed inside of the unit inspected to verify the absence of water. Once these steps have been completed and the iSOC unit is determined not to be flooded and is functional, it should be re-installed in the well following the *iSOC Installation Procedures* in Section 2.3.2.
- If water is observed in the tubing above the iSOC unit, the unit is considered to be flooded and needs to be restored following the *Instructions for Restoring iSOC Unit after Internal Flooding* provided in Attachment B of this O&M Plan.
- The flooded unit will be removed, and a spare ISOC unit will be installed in its place. Two spare ISOC units will be available and stored onsite in the Oxygen Injection System shed.
- Once the flooded unit has been properly restored or a new replacement unit is available, the restored/new unit will be installed back in the well following the *iSOC Installation Procedures* provided in Attachment B of this O&M Plan.

2.3.2 Re-Installing an iSOC Unit

- Ensure injection manifold ball valve (e.g., BV-201, BV-202, BV-203, BV-204, BV-205, BV-206, BV-207, BV-208, BV-209 or BV-210) corresponding to the oxygen delivery leg for the iSOC unit being replaced is fully closed.
- Connect tubing from injection leg manifold to iSOC unit.

- Ensure the system is pressurized (50 psi) ahead of the injection manifold ball valve (BV-X) that is closed.
- Full open the ball valve (BV-X) corresponding to the iSOC unit that is being replaced.
- Submerge iSOC unit in a bucket of water and look for the generation of 1-2 bubbles per second on the unit. Be sure to verify that the bubbles observed are not emanating from the tubing connection. If bubbles are observed from the tubing connection, retighten the connection and recheck. If bubbles persist from the connection, disassemble the tubing, reinstall it and recheck for leaks.
- Once it has been determined that the unit is operating properly, place iSOC in well following the *iSOC Installation Procedures* provided in Attachment B of this O&M Plan.

2.4 System Monitoring and Inspections

After the system has been initially adjusted and balanced and is operating in a steady-state manner, monitoring and inspection of the system will be conducted to ensure continued uninterrupted operation.

Monitoring and inspection of the system will occur according to the schedule below.

Period	Frequency	Monitoring / Inspection Activities
Initial	First week - Once every other day	• Well headspace • Water levels • DO concentrations and other parameters • Checking oxygen tanks • Balance flows • System inspection
Monthly	Once per week	• Well headspace • Water levels • DO concentrations and other parameters • Checking oxygen tanks • Balance flows • System inspection
Yearly	Once quarterly	• Well headspace • Water levels • DO concentrations and other parameters • Checking oxygen tanks • Balance flows • System inspection
Routine	Once quarterly	• Well headspace • Water levels • DO concentrations and other parameters • Checking oxygen tanks • Balance flows

		• System inspection

Note that the during the first week after the system has been commissioned, a Field Technician will visit the site on Days 1, 3, and 5 of operation. Subsequent to the initial monitoring period, the technician shall visit the site once per week for the remainder of the month. Subsequent to the first month after installation, the technician shall visit the site once every quarter (a total of four visits). It is noted that after the first week of operations the scope of the monitoring and inspection will be determined by the status of the system during inspection. Routine monitoring after the first year will be once every quarter.

Monitoring and inspection of various system components will be conducted using the methods described in this section. All measurements, inspection and testing results and any/all system adjustments shall be documented on the system check data sheet in Attachment C.

2.4.1 Monitoring

Each visit will include completing monitoring activities. This includes checking oxygen tanks, verifying/re-balancing of oxygen flows and system inspection for leaks or other issues. Also at each visit the technician will collect, at each of the ten (10) oxygen diffusion wells, water level measurements and DO concentrations. Prior to collecting these periodic measurements a headspace volatile organic compound reading and O_2/LEL reading are to be taken using a multi-gas meter (e.g., Multi-RAE, or equivalent) and recorded on the Well Monitoring Datasheet provided in Attachment C. The Multi-RAE 4-gas meter is to be setup in the work area and remain on during the collection of these periodic measurements to ensure a safe working condition.

2.4.1.1 Well Headspace Measurements

- Prior to measuring water level, total volatile organic compounds (VOCs) and O_2/LEL levels in the headspace air in each well will be measured using a mulit-gas meter and and PID.

- ***Note:*** *The meter(s) should be started, calibrated (as necessary) and operating prior to opening the well cover for any subsequent measurements / monitoring. The well cover should opened only enough to allow placement of the intake tube to the meter(s) and thus minimize the potential infiltration of outside (ambient) air and or loss of headspace air.*

- Record the maximum and steady-state total VOCs concentrations, oxygen concentrations and LEL. The measurements will be recorded on the *Well Monitoring Datasheet* provided in Attachment C of this O&M Plan.

- ***Note:*** *The Multi-RAE 4-gas meter is to be setup in the work area and remain on during the collection of water level measurements to ensure a safe working condition.*

2.4.1.2 Water Level Measurements

- Turn on water level meter; test it to verify it is working properly. Lower water level meter into well.
- Record water level depth and depth to the bottom of the well to the nearest 0.01 feet from top of casing (TOC) on the *Well Monitoring Datasheet* provided in Attachment C.
- Decontaminate equipment.

2.4.1.3 Measuring Dissolved Oxygen

Dissolved oxygen is to be measured in groundwater in each of the ten (10) oxygen diffusion wells and at select groundwater monitoring wells.

- Calibrate the multi parameter water-quality meter (e.g., YSI or equivalent) per manufacturer specifications.
- Setup water level meter, peristaltic pump, polyethylene tubing, multi-parameter water quality meter, flow through cell and container for purge water.
- Lower tubing slowly to minimize disturbance into well to the midpoint of the screen zone. If possible, keep tube intake at least two feet above the bottom of the well, to minimize mobilization of particulates present in the bottom of the well.
- Start the pump at its lowest speed setting and slowly increase the speed until discharge of groundwater occurs. Check water level. Adjust pump speed until the recharge rate of groundwater into the well is similar to pumping rate. This will be determined by steady state drawdown of the water level (i.e., drawdown is less than 0.3 feet) or no drawdown is measured. Once an appropriate pumping rate has been established, purging should continue until the measurements DO, pH, conductivity, and turbidity of three consecutive measurements (i.e., collected every 3 to 5 minutes) have stabilized.
- The flow-through-cell must be inspected periodically for the buildup of air bubbles on the probe surfaces, especially the DO probe.

  Note*: Build-up of air bubbles and or silt may affect indicator field parameter values measured within the cell. Adjusting the position of the flow cell to allow air bubbles to discharge, tapping the cell to dislodge the air bubbles or clearing the cell may need to be performed. If the cell needs to be cleaned during purging operations, continue pumping and disconnect cell for cleaning, then reconnect after cleaning and continue monitoring activity.* ***Note:*** *When the pump is turned off water in the cell must not be allowed to drain out. Monitoring probes must be submerged in water at all times during measuring.*
- Monitor and record water level and pumping rates every three to five minutes, or as appropriate, during purging. Measure the pumping rate by placing the discharge tubing from the pump in an empty graduated cylinder and measuring and the volume discharged during 30 seconds. Record this volume in ml and multiplying by 2 to determine the rate in ml per minute. Document any pumping rate adjustments, both time and the flow rate. Pumping rates should, as needed, be reduced to minimum capabilities of the pump, for example 0.1 to 0.4 liters per minute (L/min), to ensure stabilization of indicator field parameters. Adjustments are best made within the first fifteen minutes of pumping in order to minimize purging time. During pump start-up, draw down may exceed the 0.3 feet target and then recover as pump flow adjustments are made.
- **Note:** *If the static water level is above the well screen, avoid lowering the water level into the screen. Additionally, do not allow the water level to fall to or below the pump intake. The final purge volume must be greater than the stabilized draw down plus the extraction tubing volume.*
- During well purging, monitor DO and the other groundwater quality parameters (i.e., pH, specific conductance, oxidation reduction potential (ORP), turbidity and temperature) every three to five minutes or less frequent if appropriate. Note: *during the early phase of purging emphasis should be put on minimizing and stabilizing water level draw downs, and recording those adjustments*.

- Purging is considered complete readings for all parameters have stabilized. Stabilization is considered to be achieved when three consecutive readings, taken at three (3) to five (5) minute intervals, are within the following limits:
  - DO (±10%)
  - pH (±0.1 unit)
  - Specific Conductance (±3%)
  - ORP (±10 mV)
  - Turbidity (±10% for values greater than 5 NTU)
  - Temperature (±3%)
- Record all measurements on the Field Form etc.
- Decontaminate equipment.
- Dispose of purge water in appropriately labeled 55 gallon waste drum located within the system enclosure's fence.

2.4.1.4 Inspections

Procedures for inspection and maintenance of gauges, tubing, and valves include the following:

- Inspect pressure at all gauges in the supply and injection delivery system.
- Inspect and test all joints, including oxygen regulator connections, pressure gauge connections, and tubing joints.
- Verify that oxygen flow and pressure readings are consistent from one leg to the next and adjusting as necessary.
- Verify that tank pressures on each oxygen tank are consistent. Tanks that show anomalously low tank pressures shall be inspected and scrutinized for leaks.

Inspections should start with the oxygen tanks, regulators, valves, and tubing upstream of Valve BV-200. It should then move to the individual well supply legs, starting with the leg for the well farthest from the enclosure and then proceeding to the other legs in order of decreasing distance from the shed..

Procedures for inspection of oxygen tanks include the following:

- Ensure main valves located directly on top of each oxygen tank (designated "PR" on the Oxygen Injection System Layout drawing in Attachment A), before the pressure regulator, are fully open. There are six (6) in total.
- Verify that each tank contains compressed oxygen by checking that there is a reading on the tank pressure regulator gauge (PI-101A, PI-102A, PI-103A, PI-104A, PI-105A and PI-106A). Record these readings on the System Checkup Datasheet (Attachment C). If a replacement is required, as described in Section 2.2.1, make a note in the comments section of the System Checkup Datasheet and notify Project Manager.

- Ensure operating feed pressure locally at each oxygen tank is **50 psi**. If necessary, adjust each pressure regulator (PR-101, PR-102, PR-103, PR-104, PR-105 and PR-106) until the desired pressure is shown on the tank feed pressure gauge (PI-101B, PI-102B, PI-103B, PI-104B, PI-105B and PI-106B). Turn regulator valve clockwise to increase feed pressure and counterclockwise to reduce feed pressure. **AT NO POINT SHOULD ANY FEED PRESSURE BE SET ABOVE 70 PSI**. Record these pressures on the System Checkup Datasheet.
- Ensure each ball valve at the end of the feed tubing connecting the tanks to the tank manifold is fully open (BV-101, BV-102, BV-103, BV-104, BV-105 and BV-106).
- Ensure the ball valve at the end of the tank manifold (BV-200) is fully open.

2.4.1.5 Balancing Oxygen Flow (Checkup)

Balancing of oxygen flow is needed to ensure that all injection wells receive an adequate and consistent amount of oxygen. In order to accomplish this, the pressure/flow is balanced across the Injection manifold. It may be necessary to provide a slightly higher manifold pressure at legs that are further away or set deeper in order to obtain the same flow rate to all units.

- All manifold legs should be set to 55 psi.
- Record initial flow readings on each of the flowmeter rotometers (FM-201, FM-202, FM-203, FM-204, FM-205, FM-206, FM-207, FM-208, FM-209 and FM-210) on System Checkup Datasheet (Attachment C).
- Record the initial state (% open) of each leg injection manifold ball valve (BV-201, BV-202, BV-203, BV-204, BV-205, BV-206, BV-207, BV-208, BV-209 and BV-210) on the System Checkup Datasheet.
- Record the initial outlet pressure reading (PI-201, PI-202, PI-203, PI-204, PI-205, PI-206, PI-207, PI-208, PI-209 and PI-210) from each injection leg on the System Checkup Datasheet.
- If necessary, balance the flow across the manifold by manually adjusting each ball valve from left to right (BV-201 to BV-210) until all flowmeter rotometers display the same reading (±1.0 cc/min). Record the final flow readings and final state of each of the ball valves (25-100% open) on each injection leg on the System Checkup Datasheet.
- Starting with leg that feeds the furthest point adjust the pressure such that the flow measured is between 8 and 10 cc/min.
- Proceed through each manifold leg to the closest point, and ensure that the specified flow rate is maintained.
- Record the final outlet pressure reading (PI-201 to PI-210) from each injection leg on the System Checkup Datasheet.

2.4.2 Groundwater Sampling

Two (2) groundwater sampling events will be completed in order to develop baseline data associated with the system operation. Groundwater samples will be collected from six monitoring wells (MW-2, MW-4, MW-6, MW-14, MW-18, and MW-19). Prior to purging, each well will be gauged for depth to groundwater. Groundwater samples will be collected following EPA's low-stress (purge) groundwater sampling procedures (outlined in Section 2.4.2). Field measurements will be collected with a multi-parameter (YSI) meter with a flow-through cell and turbidity meter. The following parameters will be

monitored: pH, specific conductance, dissolved oxygen (DO), oxidation reduction potential (ORP), temperature, and turbidity. Once parameters have stabilized, samples will be collected in laboratory supplied bottles. Quality assurance / quality control samples to be collected will include one sample duplicate, one matrix spike, and one matrix spike duplicate. Samples will be packed in a cooler with ice and trip blank, and submitted to an analytical laboratory. Groundwater samples will be analyzed for:

- Benzene, Ethylbenzene, Toluene, and Xylenes (BTEX) by USEPA Method 8260
- Polynuclear Aromatic Hydrocarbon (PAHs) by USEPA Method 8270

The process of collecting groundwater samples at each monitoring well is as follows:

- Follow steps outlined in Measuring Dissolved Oxygen (Section 2.4.1.3) to stabilize well;
- Once the readings have stabilized, record the final measurements on the Well Monitoring Datasheet provided in Attachment C.
- Collect groundwater samples for laboratory analyses before water has passed through the flow-through cell, using a bypass assembly or disconnect cell to obtain sample. Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence.
- Note: During purging and sampling, the tube should remain filled with water so as to minimize possible changes in water chemistry upon contact with the atmosphere. It is recommended that ¼-inch or 3/8-inch (inside diameter) tubing be used to help ensure that the sample tubing remains water filled. If the pump tubing is not completely filled to the sampling point, use one of the following procedures to collect samples:
  - add clamp, connector (Teflon or stainless steel) or valve to constrict sampling end of tubing.
  - insert small diameter Teflon tubing into water filled portion of pump tubing allowing the end to protrude beyond the end of pump tubing, collect samples from small diameter tubing.
  - collect non-VOC samples first, and then increase flow slightly until the water completely fills the tubing, collect sample and record new draw down, flow rate and new indicator field parameters values.
- Label each sample as collected. Samples requiring cooling will be placed into a cooler with ice or refrigerant for delivery to the laboratory.
- Decontaminate equipment.
- Dispose of purge water in appropriately labeled 55 gallon waste drum located within the system enclosure's fence.

2.5 System Shutdown

- Remove one ISCO unit from its well, and place the unit inside a clean, empty 5-gallon bucket adjacent to the well
- Shut the manifold valve for the removed iSOC unit
- Repeat, until all iSOC units have been removed
- Fully close main valve located directly on top of each oxygen tank before the pressure regulator (Designated PR-101 through PR-106).

- Allow pressure in tank manifold (PI-101B to P-106B) and injection leg manifold (PI-201 to PI-210) to drop below 10 psi.
- Release remaining system pressure by cracking (open 25-50%) the purge valve (PV-101), located between the tank manifold and injection leg manifold and slowly bleeding out the remaining oxygen from the line. Verify pressure has been fully released from system by checking that all manifold pressure gauges are reading 0 psi (PI-101B to PI-106B; PI-201 to PI-210).
- Fully close the purge valve (PV-101) and recheck that all manifold pressure gauges are reading 0 psi.

2.6 Maintenance and Performance Monitoring Reporting Requirements

Maintenance reports and any other information generated during regular operations at the site will be kept on-file on-site. All reports, forms, and other relevant information generated will be available upon request to the NYSDEC and submitted as part of the Periodic Review Report, as specified in the Section 5 of this SMP.

2.6.1 Routine Maintenance Reports

Checklists or forms will be completed during each routine maintenance event. Checklists/forms will include, but not be limited to the following information:

- Date
- Name, company, and position of person(s) conducting maintenance activities
- Maintenance activities conducted
- Any modifications to the system
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet)
- Other documentation such as copies of invoices for maintenance work, receipts for replacement equipment, etc. (attached to the checklist/form)

2.6.2 Non-Routine Maintenance Reports

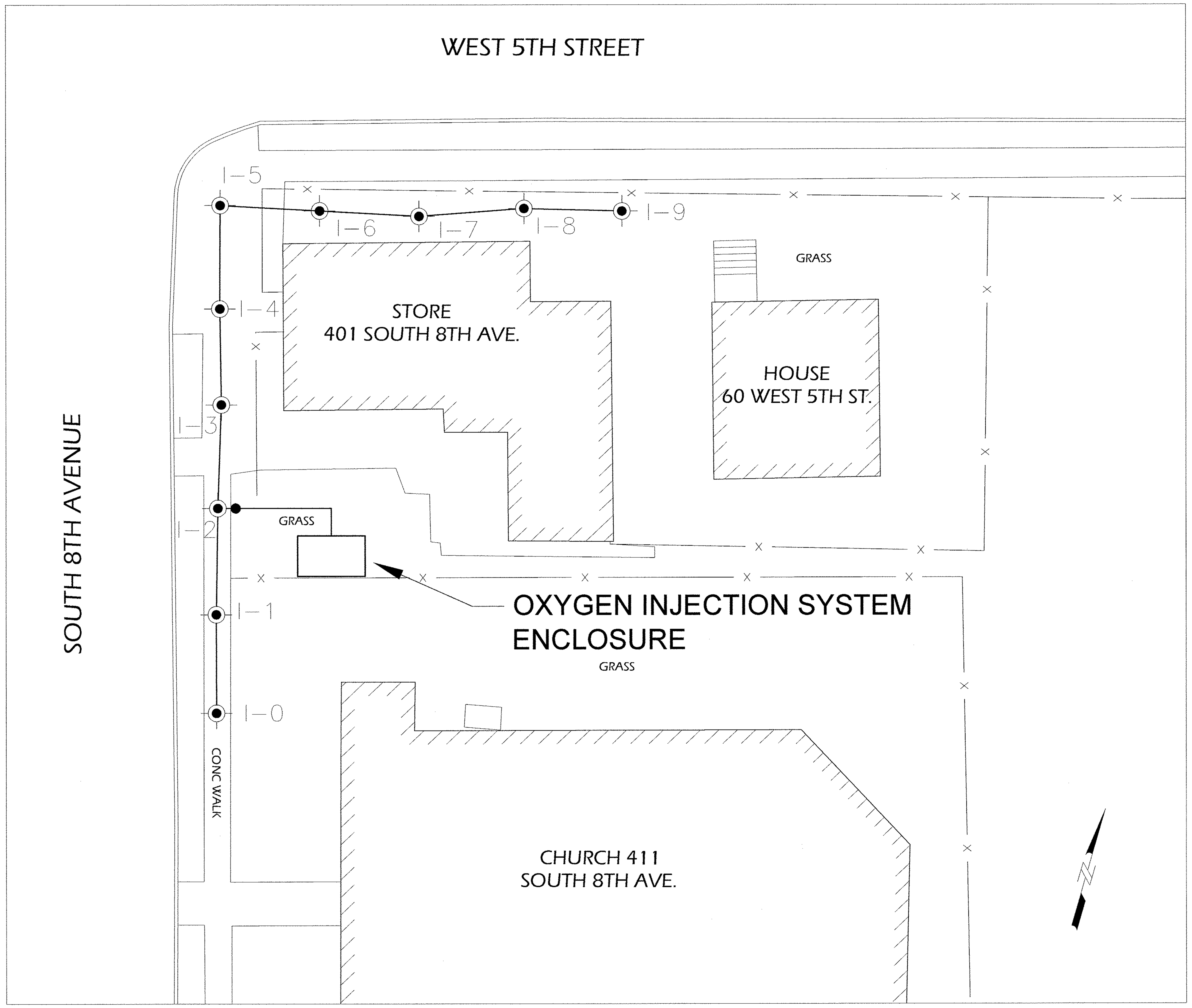
During each non-routine maintenance event as described in Section 2.3, a form will be completed which will include, but not be limited to, the following information:

- Date
- Name, company, and position of person(s) conducting non-routine maintenance/repair activities
- Presence of leaks
- Date of leak repair
- Other repairs or adjustments made to the system
- Where appropriate, color photographs or sketches showing the approximate location of any problems or incidents (included either on the form or on an attached sheet)

- Other documentation such as copies of invoices for repair work, receipts for replacement equipment, etc. (attached to the checklist/form)

Attachment A

Figures



OXYGEN INJECTION WELL LOCATIONS

SCALE = 1" = 10'

LEGEND

CURRENT BUILDING

FENCE

OXYGEN INJECTION POINTS

NOTE:

LOCATION OF INJECTION POINT I-6 IS APPROXIMATE.

AS-BUILT

NO	DRWN	DATE	REVISION	CHKD	DATE	APPVD	DATE
7							
6							
5							
4							
3							
2							
1							
0							

STATE OF NEW YORK · THOMAS P. CLARK · LICENSED PROFESSIONAL ENGINEER · 083258

1/2/13

AECOM

AECOM
78 Main Street, Suite 3
Nyack, New York 10960
www.ensr.aecom.com

CONSOLIDATED EDISON COMPANY OF NEW YORK
MOUNT VERNON WORKS
MOUNT VERNON, NEW YORK

PROJ. NUMBER: 60164006-500

DATE: 12/03/12

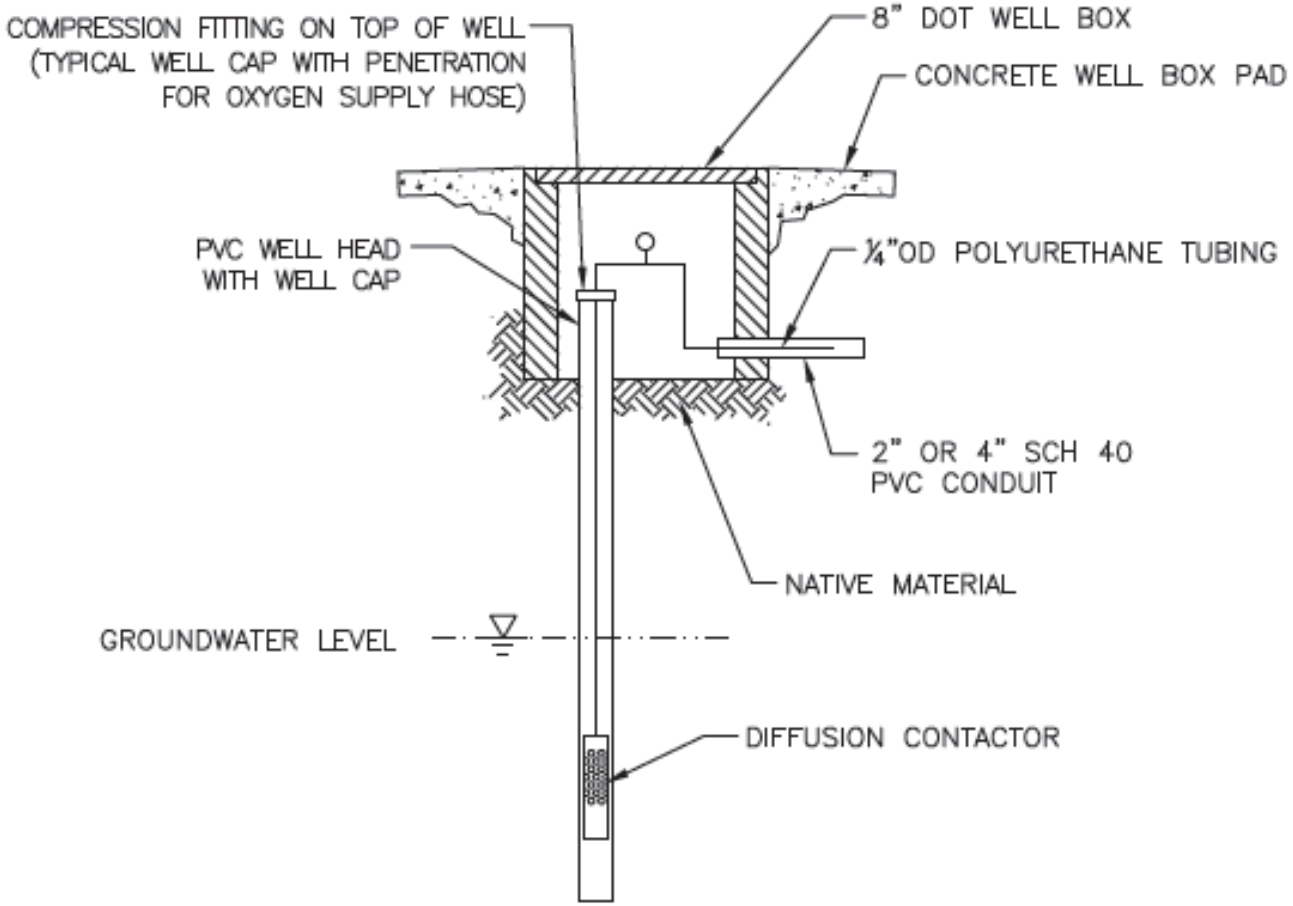
OXYGEN INJECTION SYSTEM WELL LAYOUT

FINAL ENGINEERING REPORT

DRAWING NUMBER: 01

SHEET NUMBER:

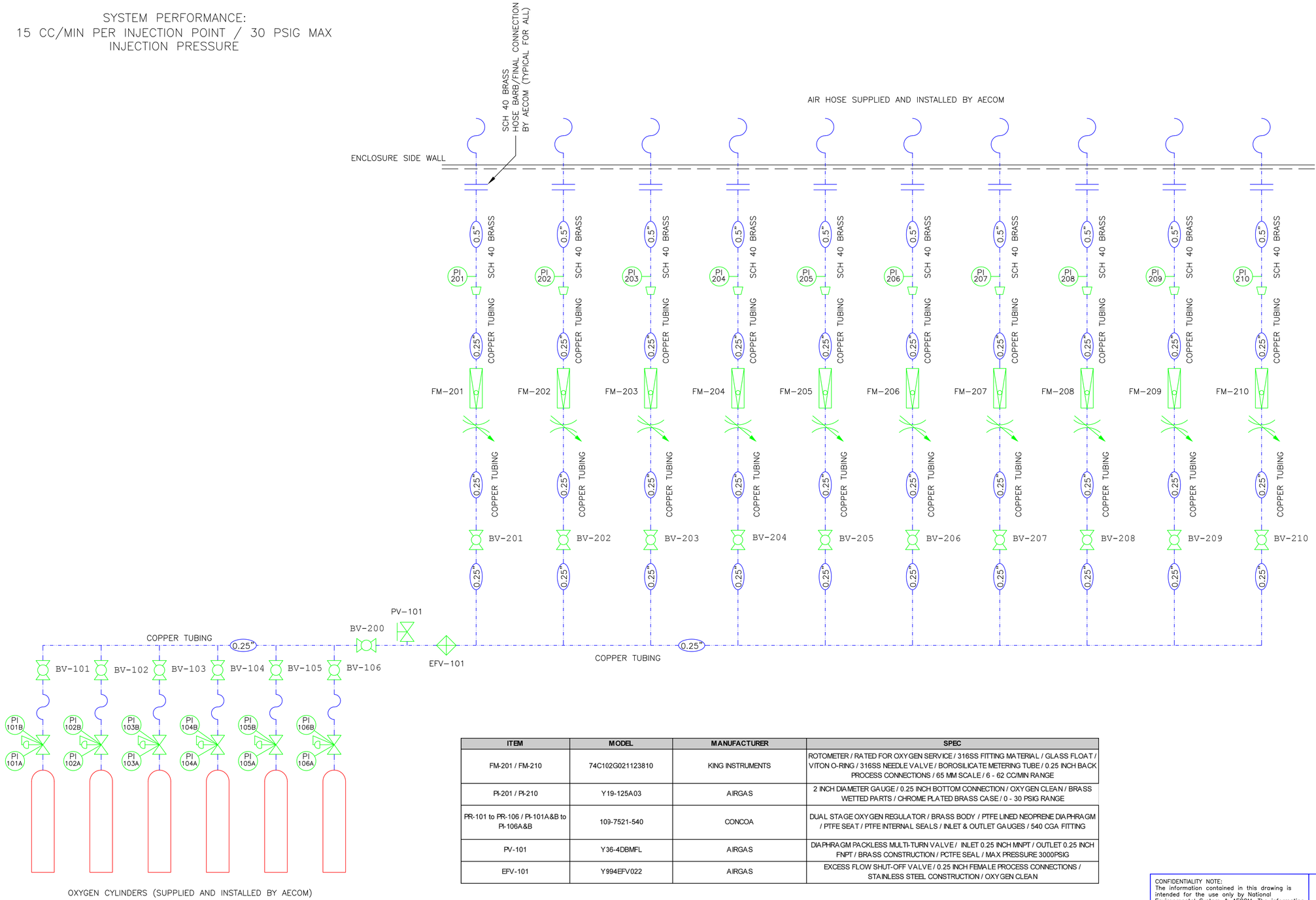
REVISION



AECOM

CONDOLIDATED EDISON COMANY OF NEW YORK MOUNT VERON WORKS MOUNT VERON, NEW YORK			**OXYGEN DIFFUSION WELL CONSTRUCTION DIAGRAM**
DATE: 09/15/14	DRWN: JEB		**FIGURE 2**

SYSTEM PERFORMANCE:
15 CC/MIN PER INJECTION POINT / 30 PSIG MAX
INJECTION PRESSURE



ITEM	MODEL	MANUFACTURER	SPEC
FM-201 / FM-210	74C102G021123810	KING INSTRUMENTS	ROTOMETER / RATED FOR OXYGEN SERVICE / 316SS FITTING MATERIAL / GLASS FLOAT / VITON O-RING / 316SS NEEDLE VALVE / BOROSILICATE METERING TUBE / 0.25 INCH BACK PROCESS CONNECTIONS / 65 MM SCALE / 6 - 62 CC/MIN RANGE
PI-201 / PI-210	Y19-125A03	AIRGAS	2 INCH DIAMETER GAUGE / 0.25 INCH BOTTOM CONNECTION / OXYGEN CLEAN / BRASS WETTED PARTS / CHROME PLATED BRASS CASE / 0 - 30 PSIG RANGE
PR-101 to PR-106 / PI-101A&B to PI-106A&B	109-7521-540	CONCOA	DUAL STAGE OXYGEN REGULATOR / BRASS BODY / PTFE LINED NEOPRENE DIAPHRAGM / PTFE SEAT / PTFE INTERNAL SEALS / INLET & OUTLET GAUGES / 540 CGA FITTING
PV-101	Y36-4DBMFL	AIRGAS	DIAPHRAGM PACKLESS MULTI-TURN VALVE / INLET 0.25 INCH MNPT / OUTLET 0.25 INCH FNPT / BRASS CONSTRUCTION / PCTFE SEAL / MAX PRESSURE 3000PSIG
EFV-101	Y994EFV022	AIRGAS	EXCESS FLOW SHUT-OFF VALVE / 0.25 INCH FEMALE PROCESS CONNECTIONS / STAINLESS STEEL CONSTRUCTION / OXYGEN CLEAN

LEGEND

PI PRESSURE INDICATOR
FM FLOWMETER

EXCESSIVE FLOW SHUT-OFF VALVE
BALL VALVE
LOCAL GAUGE
PURGE VALVE
PRESSURE REGULATOR
NEEDLE VALVE
PIPE REDUCER
ROTOMETER
FIELD CONNECTION REQUIRED

GAS (OXYGEN) LINE

REVISIONS			

NES NATIONAL ENVIRONMENTAL SYSTEMS
84 Dunham Street – Attleboro, MA. 02703
508-226-1100 (Phone) / 508-226-1180 (Fax)

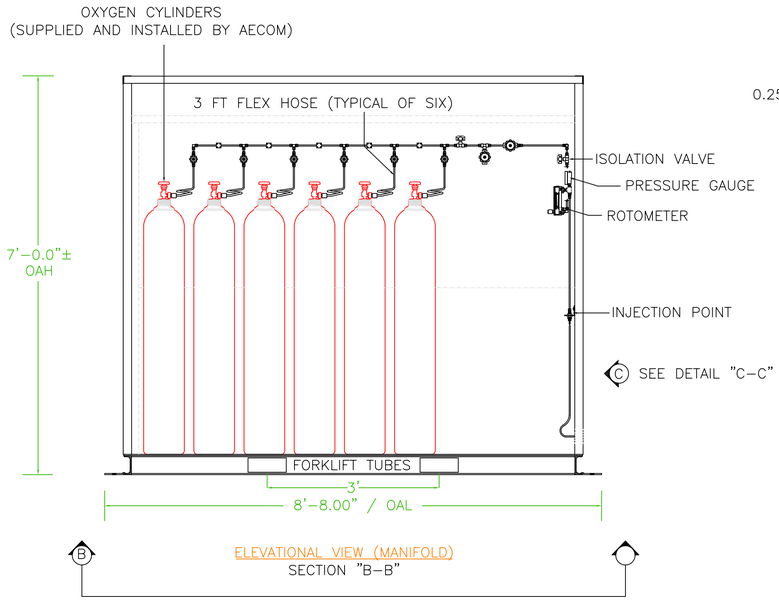
DRWN BY CJJ	DATE 2-22-13
CHK BY	DATE
APPR BY	DATE

TITLE
IN-SITU BIO-REMEDIATION PILOT TEST SYSTEM
PROCESS & INSTRUMENTATION DIAGRAM

ISOCS 02 SUPPLY SYSTEM – MT VERNON, NY
AECOM (MA)

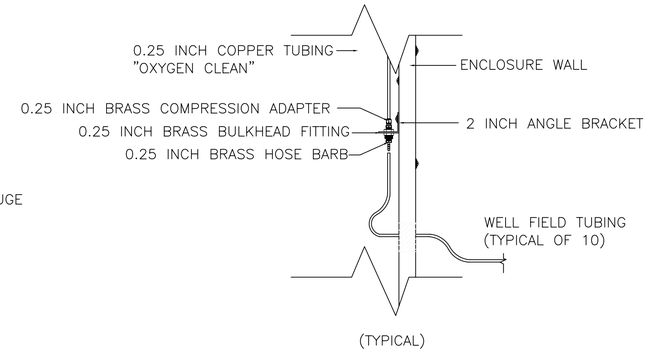
JOB NO. 12-161

SCALE	SIZE	DWG NO.	SHEET	REV
N/A	D	M-2	1 OF 1	

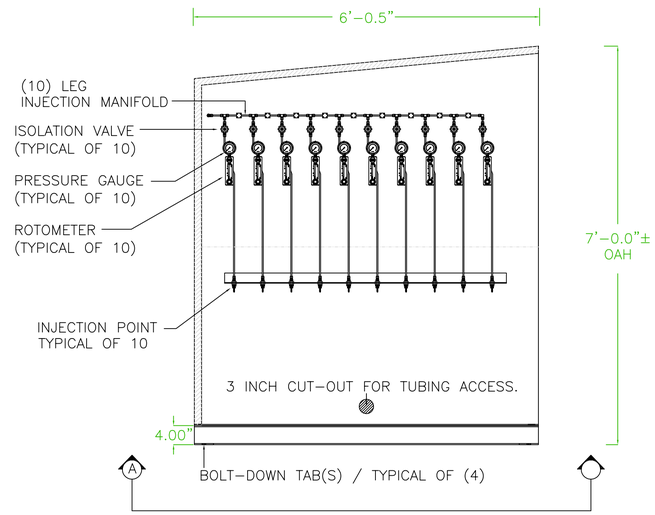


ELEVATIONAL VIEW (MANIFOLD)
SECTION "B-B"

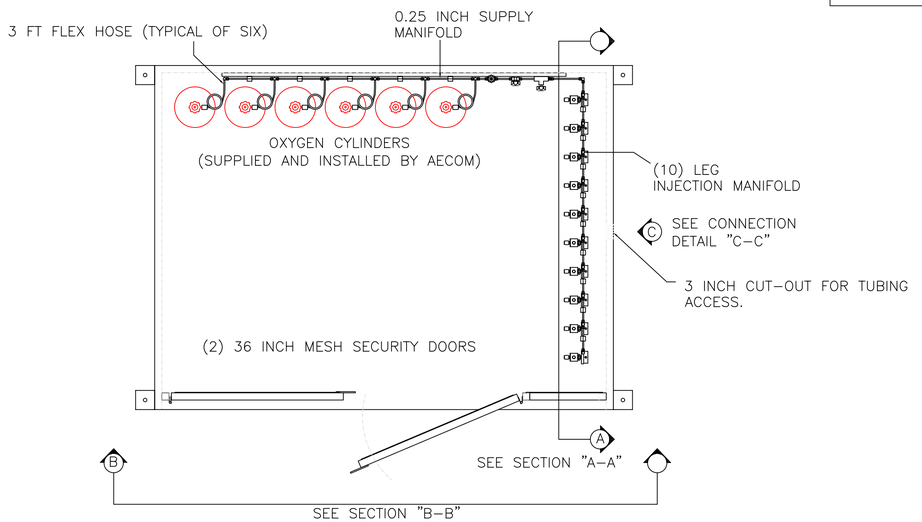
MANIFOLD (EXTERNAL) CONNECTION DETAIL
SECTION "C-C"



(TYPICAL)



ELEVATIONAL VIEW (MANIFOLD)
SECTION "A-A"



NOTES;
1. DRAWING DEPICTS PRELIMINARY LAYOUT ONLY. SOME EQUIPMENT/PLUMBING LOCATIONS MAY CHANGE DURING CONSTRUCTION. ANY MAJOR CHANGES WILL BE BROUGHT TO THE ATTENTION OF AECOM FOR REVIEW.
2. BASE AND FRAME ARE CONSTRUCTED FROM CARBON STEEL AND PAINTED WITH A INDUSTRIAL ENAMEL PAINT (ANTI-SKID FOR WALKING SURFACES). FRAME IS THEN WRAPPED WITH GALVANIZED STEEL PLATES.
3. LOCKING DOORS AND CYLINDER RESTRAINTS NOT SHOWN FOR DRAWING CLARITY.
4. FINAL CONNECTION (LABOR AND MATERIAL) TO INJECTION WELLS IS THE RESPONSIBILITY OF AECOM.
5. ENCLOSURE TIE-DOWN(S) AND DOOR LOCKS TO BE PROVIDED BY AECOM.

REV.	DESCRIPTION	DATE	APPR.
	REVISIONS		

NES NATIONAL ENVIRONMENTAL SYSTEMS
84 Dunham Street – Attleboro, Massachusetts
508-266-1100 (Phone) / 508-266-1180 (Fax)

DRWN BY CJJ	DATE 1-22-13
CHK BY	DATE
APPR BY	DATE

TITLE: PRELIMINARY EQUIPMENT LAYOUT
8 FT X 6 FT ENCLOSURE

ISOCS 02 SUPPLY SYSTEM – MT VERNON, NY
AECOM (MA)

JOB NO.	SCALE	SIZE	DWG NO.	SHEET	REV
12-161	N/A	D	M-4	1 OF 4	

Attachment B

Equipment Manuals (OEMs)

NES Project: 12-161
ISOCS Oxygen Supply System
Con-Ed – Mt. Vernon, NY

Oxygen Delivery Components

Dual Stage Compressed Gas Regulators - Concoa Model 109-7521-540

Header Purge Valve - Airgas Model Y36-4DBMFL

Excess Flow Shut-off Valve - Airgas Model Y99-4EFV022

Injection Flowmeter with Needle Valve, 6 – 62 cc/min - King Model 74C102G021123810

Injection Pressure Gauge, 0-30psig - Airgas Model Y19-125A03

100 Series Regulators

109-7521-540

109

- Dual Stage
- Forged Brass Body
- PTFE-Lined Diaphragm
- Five Port Configuration

109 7505 shown

The 109 Series regulators are intended for pressure control of general purpose laboratory gases with applications requiring constant pressure control and delivery regardless of supply pressure variations.

Typical Applications

- Purging
- Pressure testing
- Blanketing
- Chamber pressurization

Features

Capsule® Seat
Increased serviceability and life

PCTFE-Lined Neoprene Diaphragm
Sensitive to downstream conditions

Forged Body
Durable, long-lasting construction

Field-Adjustable Pressure Limit
Safeguard downstream equipment

Integral Relief Valve
Diaphragm and gauge protection

High Flow Capacity
Supply multiple user locations

Forged Brass Body
Economical high purity design

Pressure Ranges 0-15 to 0-200 PSIG
Broad range of applications

10 Micron Filtration in Both Stages
Fail-safe seat performance

Materials

Body
Forged brass

Bonnet
Brass-plated die cast zinc

Seat
PTFE

Filter
10 micron sintered bronze

Diaphragm
PTFE-lined neoprene

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

Gauges
2 1/2" diameter brass

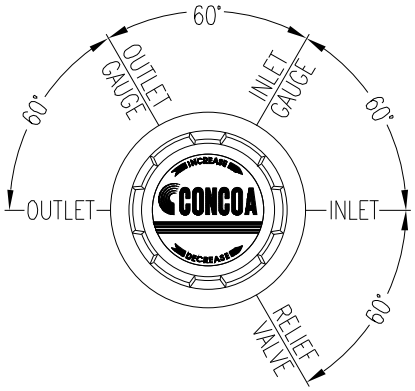
Ports
1/4” FPT

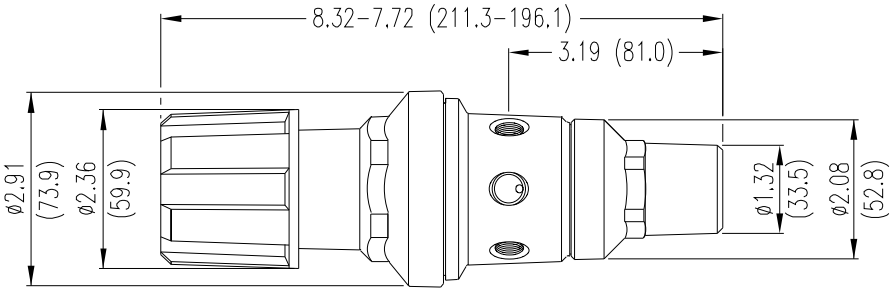
Cv
0.28

Weight (109 7513-580)
4.69 lbs. (2.13 kg)

CRN OH 5216.5C

Installation Information





Ordering Information

Order No. (109 Series Dual Stage)	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assembly
109 7501-CGA	0-15 PSIG	0-30 PSIG	0-4000 PSIG	1/4" tube fitting
109 7502-CGA	0-15 PSIG	0-30 PSIG	0-4000 PSIG	Needle valve 1/4" MPT
109 7504-CGA	0-40 PSIG	0-60 PSIG	0-4000 PSIG	1/4" tube fitting
109 7505-CGA	0-40 PSIG	0-60 PSIG	0-4000 PSIG	Needle valve 1/4" MPT
109 7512-CGA	0-120 PSIG	0-200 PSIG	0-4000 PSIG	1/4" tube fitting
109 7513-CGA	0-120 PSIG	0-200 PSIG	0-4000 PSIG	Needle valve 1/4" MPT
109 7520-CGA	0-200 PSIG	0-400 PSIG	0-4000 PSIG	1/4" tube fitting
109 7521-CGA	0-200 PSIG	0-400 PSIG	0-4000 PSIG	Needle valve 1/4" MPT

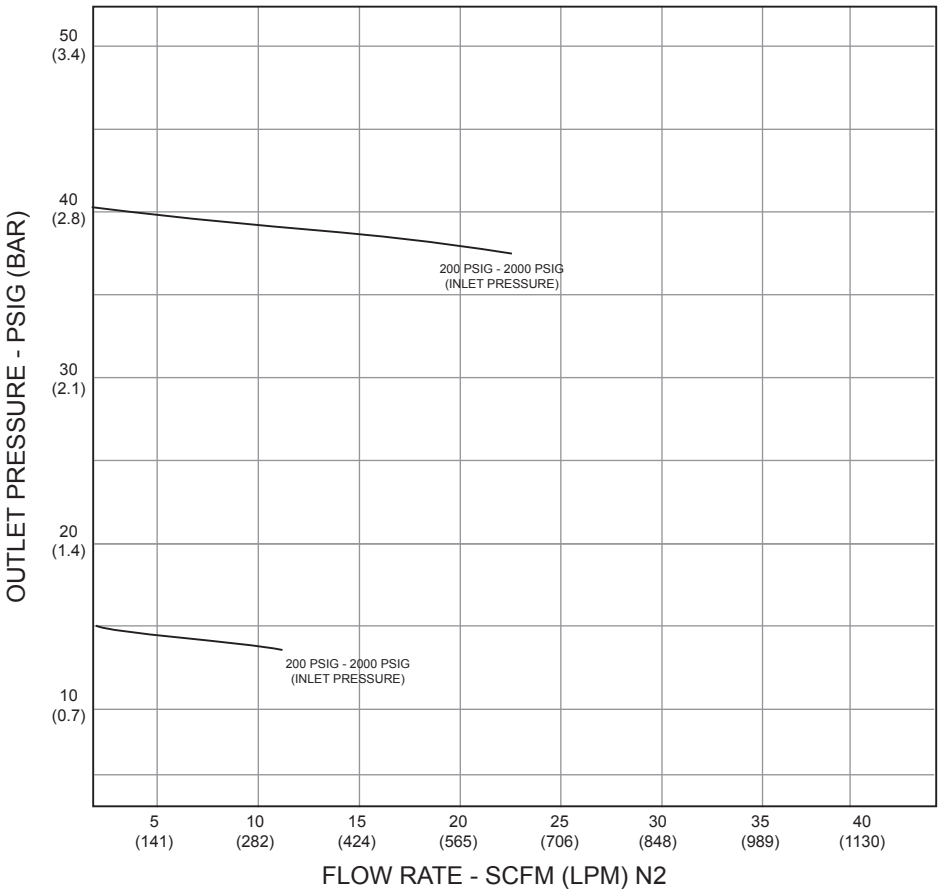
CGA = 540 O2

Related Options

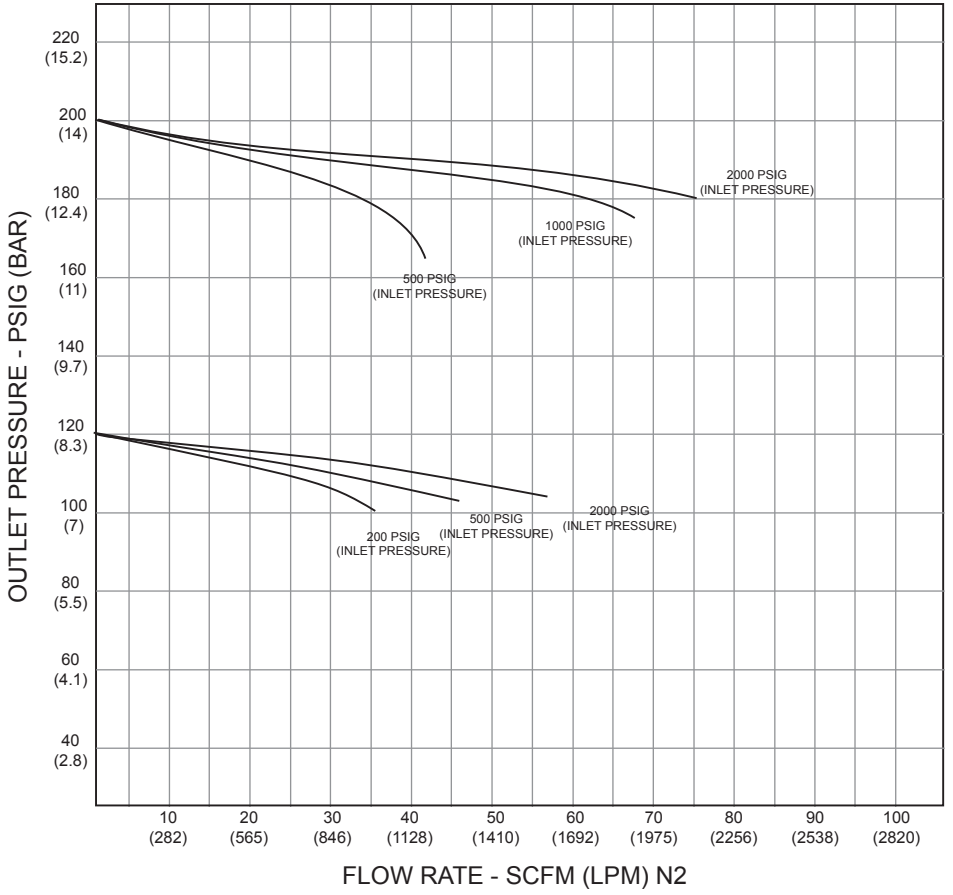
Options	Order No.	Description
Protocol station	Add letter “M” after inlet	Convenient regulator wall mount, including tee, bracket, and flexible Stainless Steel hose with check valve in the inlet gland
Protocol purge station	Add letter "Q" after inlet	Convenient regulator wall mount with purge

Flow Curves for
109 Series Dual Stage Regulator

109 Series Dual Stage Regulator



109 Series Dual Stage Regulator



Diaphragm Packless Valves

Description: These high-integrity valves are recommended for gas handling systems where inboard diffusion of air or moisture must be kept to a minimum. The valves have multiple metal diaphragms that provide a permanent seal capable of passing the helium leak test to 1 x 10^{-8} ccs.

These valves come in multiturn and quarter turn models.

Specifications/Materials	
Maximum Operating Pressure	3,000 psig
Flow Capacity	Cv=0, 16, orifice 0.094
Ambient Operating Temperature	-40° F to +200° F
Body	Brass or Stainless Steel
Seat	PCTFE

Ordering Information (multi-turn models)

Product Number	Length	Material	CONNECTIONS	
			Inlet	Outlet
Y36–2DCC	2 3/8"	316 SS	1/8" Compression*	1/8" Compression*
Y36–4DBMM	2 3/8"	Brass	1/4" MNPT	1/4" MNPT
Y36–4DBMFL	3 3/8"	Brass	1/4" MNPT	1/4" FNPT
Y36–4DFF	2 3/8"	316 SS	1/4" FNPT	1/4" FNPT
Y36–4DMM	2 3/8"	316 SS	1/4" MNPT	1/4" MNPT
Y36–4DMC	2 3/8"	316 SS	1/4" MNPT	1/8" Compression*
Y36–4DMFL	3 3/8"	316 SS	1/4" MNPT	1/4" FNPT

Ordering Information (1/4-turn models)

Product Number	Lever Color	Length	Material	CONNECTIONS	
				Inlet	Outlet
Y37–2DCC	Silver	2 3/8"	316 SS	1/8" Compression*	1/8" Compression*
Y37–4DBCC	Silver	2 3/8"	Brass	1/4" Compression*	1/4" Compression*
Y37–4DBMM	Silver	2 3/8"	Brass	1/4" MNPT	1/4" MNPT
Y37–4DBMFL	Silver	3 3/8"	Brass	1/4" MNPT	1/4" MNPT
Y37–4DFF	Silver	2 3/8"	316 SS	1/4" FNPT	1/4" FNPT
Y37–4DMFL	Silver	2 3/8"	316 SS	1/4" MNPT	1/4" FNPT

*All compression ends are two-piece ferrule construction.

Excess Flow Shut-Off Valve

Description: The Airgas® Excess Flow Shut-Off Valve is a non-attitude sensitive, excess flow shut-off valve designed to operate with a wide range of inlet pressures.

The capability of operating from 10 to 3,500 psig allows it to be used either between a high-pressure source at the inlet to the pressure regulator, or in the low-pressure delivery line to a process. In both applications, this control valve will automatically shut off the delivery of gas if it exceeds a preset limit.

The functional components of the Airgas Excess Flow Shut-Off Valve are incorporated within the body style of a $1^1/_4$ inch Quantum valve. An actuating knob has been designed to manually operate the valve and clearly indicate the relative operating position - either "Open (Reset)" or "Auto (Shut Off)." A pneumatic actuator may be substituted for the knob, which makes it possible to reset the valve by sending a pressure signal from a remote source.

The Airgas Excess Flow Shut-Off Valve is offered with six different pressure/low limits: A, B, C, D, E, and F (see flow curve). The nominal differential pressure created at the flow limit is 5 psig for limit valves A, B, C, and D. For limit values E and F, the differential pressure is 12 psig. The differential pressure that is created is not affected by mounting orientation (non-attitude sensitive).

Design Features

Control Valve Automatically Shuts Off
the gas delivery if the gas flow exceeds a preset limit.

Differential Pressure Not Affected
by mounting orientation (non-attitude sensitive).

Specifications	
Maximum Rate Inlet Pressure	3,500 psig (241 bar)
Flow Shut-Off @ 1000 psi Inlet	5, 9, 22, 40, 72, 121 slpm
Ambient Operating Temperature	-10° F to 150° F (-23° C to 66° C)
Designed Leak Rate	2 x 10^{-9} ccs (helium)
Weight	12.5 oz. (.32 kg)
Inlet	$^1/_4$" FNPT
Outlet	$^1/_4$" FNPT
Differential Pressure Effect	5 psig (3 bar) @ 30 psig; 12 psig (8 bar) @ 1,000 psig
Orifice	Hastelloy C-22®
Poppet	Hastelloy C-22®
Spring	Hastelloy C-22®

Materials	
Body	Stainless Steel
Bonnet	Stainless Steel
Seat	PCTFE
Diaphragm	Elgiloy®
Valve Stem	Stainless Steel (lubricated)
Valve Spring	Hastelloy C-22®

Ordering Information

Product Number	Material	1,000 psig Inlet Press.	30 psig Inlet Press.
Y99-4EFV005	Stainless Steel	4.8 SLPM	0.4 SLPM
Y99-4EFV009	Stainless Steel	9.1 SLPM	1.7 SLPM
Y99-4EFV022	Stainless Steel	21.8 SLPM	3.9 SLPM
Y99-4EFV040	Stainless Steel	39.5 SLPM	9.0 SLPM
Y99-4EFV072	Stainless Steel	72.3 SLPM	14.4 SLPM
Y99-4EFV121	Stainless Steel	120.6 SLPM	22.5 SLPM

7430 Series

74C102G021123810

Glass Tube

Both 65 mm and 150 mm scales, borosilicate glass tube models feature all stainless steel frame and horizontal connections at a less expensive price than competitive products. Valve optional.

DESCRIPTION

Metering Tube
Borosilicate Kinglass

Internal Components
316L Stainless Steel, Black Glass, Sapphire, Carboloy, Tantalum

Inlet/Outlet Fittings
1/8" and 1/4" FNPT, Horizontal
Control Valve optional

Fitting Material
316L Stainless Steel
Optional: PVC, PVDF, Hastelloy®

Elastomers
Standard: Viton®
Optional: Buna N, EPR, Kalrez®

PERFORMANCE

Capacities
0.56 to 1,800 cc/min — Water
54 to 70,000 cc/min — Air

Scale
65 mm, 150 mm
Direct reading, detachable

Accuracy
± 6% of Full Scale Flow, 65 mm
± 4% of Full Scale Flow, 150 mm

Turndown
10:1 unless otherwise indicated

Repeatability
1%

Max Temperature
250° F (121° C) Gases
200° F (93° C) Liquids

Max Pressure
316L SS Fittings — 200 psig
PVC Fittings — 130 psig
PVDF Fittings — 150 psig

Ambient Temperature
33° F to 125° F (1° C to 52° C)

OPTIONS

Alarm
Fiber-Optic or Inductive Ring Sensor
(see page 19)

Certified Calibrations
Conform to ISA RP 16.6

Scales
Can be produced in any volumetric unit

SPECIFICATIONS:

74C 102G021 123810

Tube Number	Float Material	Air (STP)			Water (70° F)		
		CC/MIN	SCFH	SLPH	CC/MIN	GPH	LPH
1-02-G-021	Glass	66	.14	4.0	0.72	.011	.042
	Sapphire	105	.22	6.2	1.3	.021	.078
	Stainless Steel	200	.42	12.0	3.3	.052	.190
	Carboloy	340	.70	20.0	7.0	.110	.420
	Tantalum	350	.74	21.0	7.8	.125	.460
1-03-G-041	Glass	76	.16	4.6	1.15	.018	.068
	Sapphire	120	.25	7.2	2.10	.032	.125
	Stainless Steel	230	.50	14.0	4.20	.068	.260
	Carboloy	400	.85	24.0	9.00	.145	.560
	Tantalum	440	.90	26.0	10.00	.165	.620
1-08-G-061	Glass	525	1.1	31	9.0	.14	.54
	Sapphire	700	1.5	42	15.5	.24	.95
	Stainless Steel	1130	2.4	68	29.0	.46	1.70
	Carboloy	1600	3.4	95	46.0	.72	2.80
	Tantalum	1700	3.6	100	50.0	.78	3.00
1-23-G-081	Glass	2000	4.2	120	44	.70	2.6
	Sapphire	2600	5.4	150	68	1.05	4.0
	Stainless Steel	3800	8.2	230	110	1.70	6.6
	Carboloy	5600	12.0	340	170	2.70	10.5
	Tantalum	6000	13.0	360	180	2.90	11.0
2-14-G-021	Glass	6800	14.5	400	160	2.6	9.5
	Sapphire	9200	19.5	540	240	3.8	14.5
	Stainless Steel	13000	28.0	800	400	6.2	24.0
	Carboloy	19000	40.0	1100	600	9.5	36.0
	Tantalum	20000	42.0	1200	640	10.0	38.0
2-34-G-041	Glass	19000	40.0	1150	520	8.25	31.0
	Sapphire	25000	52.0	1500	740	11.50	44.0
	Stainless Steel	42500	90.0	2550	1200	19.00	72.0
	Carboloy	60000	125.0	3600	1700	27.00	105.0
	Tantalum	70000	145.0	4200	1800	29.00	110.0

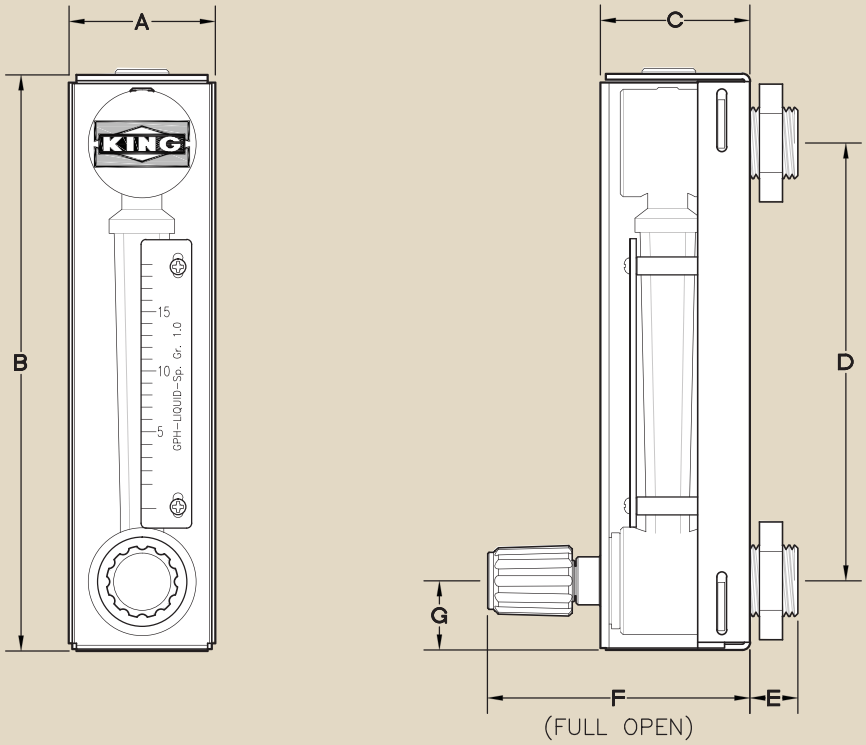
150 MM Scale Flow Ranges

Tube Number	Float Material	Air (STP)			Water (70° F)		
		CC/MIN	SCFH	SLPH	CC/MIN	GPH	LPH
1-03-G-022	Glass	54	.114	3.2	.56	.0088	.033
	Sapphire	82	.175	4.9	1.04	.0160	.062
	Stainless Steel	160	.340	9.8	2.25	.0350	.135
	Carboloy	280	.580	16.5	5.00	.0780	.300
	Tantalum	300	.620	17.5	5.20	.0840	.320
1-04-G-042	Glass	106	.225	6.4	1.24	.0195	.074
	Sapphire	165	.35	10.0	2.35	.0380	.145
	Stainless Steel	320	.68	19.0	5.60	.0900	.340
	Carboloy	540	1.14	32.0	12.4	.1950	.740
	Tantalum	580	1.24	35.0	13.5	.2100	.820
1-07-G-062	Glass	350	.74	21.0	4.7	.074	.28
	Sapphire	500	1.06	30.0	10.0	.160	.60
	Stainless Steel	820	1.75	50.0	20.5	.330	1.25
	Carboloy	1250	2.60	76.0	34.0	.540	2.05
	Tantalum	1350	2.90	80.0	36.0	.560	2.15
1-11-G-082	Glass	850	1.8	50.0	16.5	.26	1.0
	Sapphire	1100	2.3	66.0	27.0	.42	1.6
	Stainless Steel	1600	3.4	100.0	46.0	.72	2.7
	Carboloy	2300	4.9	140.0	72.0	1.15	4.4
	Tantalum	2450	5.2	155.0	80.0	1.25	4.8
1-27-G-102	Glass	2150	4.6	130.0	52	.84	3.1
	Sapphire	2800	6.0	170.0	78	1.24	4.7
	Stainless Steel	4400	9.2	260.0	130	2.05	7.8
	Carboloy	6200	13.5	380.0	205	3.20	12.5
	Tantalum	6750	14.0	400.0	210	3.30	12.5
2-09-G-002	Glass	3800	8.2	230.0	86	1.35	5.2
	Sapphire	5000	10.6	300.0	130	2.05	7.8
	Stainless Steel	7500	16.0	450.0	220	3.40	13.0
	Carboloy	10600	22.5	640.0	330	5.20	20.0
	Tantalum	11500	24.0	680.0	360	5.60	21.5
2-17-G-022	Glass	9000	19.0	540.0	215	3.40	13.0
	Sapphire	11400	24.5	700.0	320	5.00	19.0
	Stainless Steel	17000	36.0	1000.0	520	8.20	31.0
	Carboloy	24000	50.0	1450.0	760	12.2	46.0
	Tantalum	25000	54.0	1500.0	820	13.0	49.0
2-32-G-042	Glass	20500	43.0	1220.0	470	7.5	28.0
	Sapphire	26000	56.0	1550.0	700	11.0	42.0
	Stainless Steel	38000	82.0	2300.0	1120	18.0	68.0
	Carboloy	54000	116.0	3300.0	1650	26.0	100.0
	Tantalum	60000	125.0	3500.0	1750	28.0	106.0

DIMENSIONS

Detail Letter	Scale length	
	65mm	150mm
A	1.50	1.50
B	6.05	10.25
C	1.56	1.56
D	4.53	8.826
E	0.50	.050
F	2.90	2.90
G	0.73	0.73

DIMENSION DIAGRAM



74C 102G021 1 2 3 8 1 0

ORDERING:

Use the following guide to determine the specific product number you require.

7 4 C

Meter Series	Tube Number	Float Material	Fitting Material	O-ring Material	Scale	Valve Option	Optional Alarm Switch
	See Specifications Table	Glass - 1	316L SS - 1/8" F NPT - 1	EPR - 1	Millimeter - 1	316L SS - Inlet - 1	Without Alarm - 0
		Sapphire - 2	316L SS - 1/4" FNPT - 2	Buna-N - 2	GPH Water@70°F - 2	316L SS - Outlet - 2	Fiber-Optic NPN (Proximity) - 1
		316 SS - 3	PVC - 1/4" FNPT - 3	Viton® - 3	LPH Water@70°F - 3	No Valve - 3	Fiber-Optic PNP (Proximity) - 2
		Carboloy - 4	PVC - 1/8" FNPT - 4	Kalrez® No Valve - 4	CC/MIN Water@STP - 4	PVC - Inlet - 4	Inductive Ring Sensor (Proximity) - 3
		Tantalum - 5	PVDF - 1/4" FNPT - 5	Kalrez® Valve - 5	SCFH Air@STP - 5	PVC - Outlet - 5	Inductive Ring Sensor (Latching) - 4
			PVDF - 1/8" FNPT - 6		SLPH Air@STP - 6	PVDF - Inlet - 6	
			Hastelloy® C -1/4" FNPT - 7		SCC/MIN Air@STP - 7	PVDF - Outlet - 7	
			Hastelloy® C -1/8" FNPT - 8		Non standard - 8	Hastelloy® C - Inlet - 8	
						Hastelloy® C - Outlet - 9	

Pressure Gauges 2½"

Description: Airgas® offers a wide selection of industry standard pressure gauges. These nickel-plated brass, stainless steel and monel gauges feature a single psig scale. All gauges are cleaned to analytical and oxygen service standards.

The large, bold font makes valves very easy to read.

Rated accuracy is stated as a percentage of full-scale reading of the gauge. Brass and Monel gauges are accurate to ±3% for the first third of the scale, ±2% of the second third, and ±3% of the last third of the scale. All stainless steel gauges are accurate to ±1% full scale.

All gauges meet ASTM standards for safety and have a ¼" MNPT lower-mount design (except where noted).

Specifications	
Bourdon Tube	Brass — phosphor bronze up to 1,000 psig; beryllium copper above 1,000 psig Stainless Steel — 316 stainless steel Monel — Monel
Connections	¼" MNPT lower mount except where noted
Safety	Oversized case cutout for socket
Ambient Operating Temperature	–40° F to +150° F
Accuracy	See Description
Shipping Weight	1 lb

Ordering Information

Product Number	Material	Range	Graduations
* Y19-115A03	Brass	0-30	1
* Y19-115C10	Brass	0-100	2
**Y19-115D40	Brass	0-4,000	100
Y19-125A015	Brass	0-15	0.5
Y19-125A0303	Brass	30" HG-0-30	1
Y19-125A03	Brass	0-30	1
Y19-125A06	Brass	0-60	2
Y19-125C10	Brass	0-100	2
Y19-125C20	Brass	0-200	5
Y19-125C40	Brass	0-400	10
Y19-125C50	Brass	0-500	10
Y19-125D10	Brass	0-1,000	20
Y19-125D40	Brass	0-4,000	100
Y19-125D60	Brass	0-6,000	100
Y19-125D00	Brass	0-10,000	200
Y19-325A03	Monel	0-30	1
Y19-325C10	Monel	0-100	2
Y19-325C30	Monel	0-300	5
Y19-325C50	Monel	0-500	10
Y19-325D10	Monel	0-1,000	20
Y19-325D30	Monel	0-3,000	50
Y19-425A0303	Stainless Steel	30" Hg-0-30	1
Y19-425A03	Stainless Steel	0-30	1
Y19-425A06	Stainless Steel	0-60	2
Y19-425C10	Stainless Steel	0-100	2
Y19-425C20	Stainless Steel	0-200	5
Y19-425C40	Stainless Steel	0-400	10
Y19-425C50	Stainless Steel	0-500	10
Y19-425D10	Stainless Steel	0-1,000	20
Y19-425D30	Stainless Steel	0-3,000	50
Y19-425D40	Stainless Steel	0-4,000	50
Y19-425D60	Stainless Steel	0-6,000	100
Y19-425D00	Stainless Steel	0-10,000	200

* ⅛" MNPT rear mount 2" Dia.
** ¼" MNPT bottom mount 2" Dia.

GAUGES | Pressure Gauges VCR

VCR Connection Gauges 2" Diameter

Ordering Information	2" female VCR® models		
Product Number	**Material**	**Range**	**Graduations**
Y19-413937	Stainless Steel	0-4,000	100
Y19-413938	Stainless Steel	0-3,000	50
Y19-413939	Stainless Steel	0-1,000	20
Y19-413940	Stainless Steel	0-200	5
Y19-413941	Stainless Steel	0-100	2
Y19-413942	Stainless Steel	30" Hg-0-30	1
Y19-413943	Stainless Steel	0-30	1
Y19-415125	Stainless Steel	0-60	2

iSOC® Technology

iSOC® System O & M Checklist

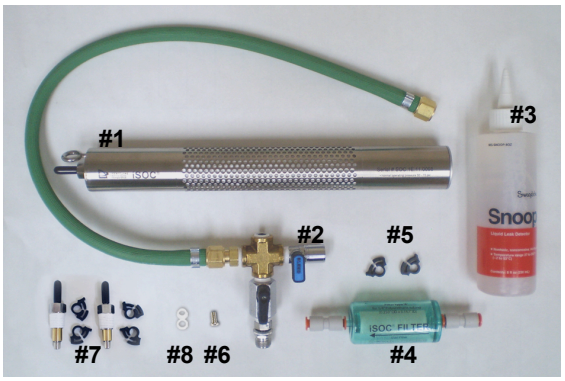
Step	Task	Corrective Action
1	**Check pressure setting on regulator.** Pressure should be set at 50 psi (3.4 bar)for water depths of less than 60 feet or 25 psi above the head of water for greater depths (33 feet of water = 14.7 psi and 10 m of water = 1 bar).	Turn gas regulator knob clockwise to increase desired pressure. Turn regulator knob counter clockwise and momentarily open purge valve on distribution header to reduce pressure.
2	**Check Gas Supply in Cylinder** Is the cylinder empty? Why? Is there a leak?	Use Snoop to test for gas leaks. Check all fittings; Repair gas leaks;
3	**How To Replace The Gas Cylinder**	Close iSOC® connection valves to trap gas; Quickly exchange cylinders. Re-open valves after changing gas bottle.
4	**Check iSOC® for flooding** (1) Submerge iSOC® in a bucket of water (2) Make sure tubing is ok. (3) Remove drain plug; (4) Is water in the tube above the iSOC®? (5) Follow installation procedures and place iSOC® in bucket of water	(1) Should see 1-2 bubbles every 1-2 seconds coming from side of iSOC®. (2) Un-kink; check for damage/leak. (3) Should see bubbles in (1) above.
5	**Re-install the iSOC** (1) Connect tubing iSOC® Distribution Header and iSOC® (2) Close Two Stage regulator (3) Pressurize the system. (4) Open regulator (5) Submerge iSOC® in a bucket of water. (6) Place iSOC® in well.	(1) Set regulator at 50 psi (3.4) or compute head for water depths over 60 feet (18.3 m) (2) Look for 1-2 bubbles every few seconds.
6	**Check For Safety**	Secure gas cylinders and check for gas leaks.
7	**Do You Still Need Assistance?** Call iSOC® Representative	Discuss over the phone; Or iSOC® Rep may need to do site visit.

iSOC® Technology

iSOC® Installation Specification Sheet

ITEMS SUPPLIED PER iSOC® WITH iSOC® SYSTEM:

1. iSOC® unit with lifting eye
2. Distribution header complete with 2' long oxygen hose, regulator connection ('B' size oxygen right hand, CGA-022, 9/16"-18), bleed valve, and iSOC® Swagelok connection (part#: SS-400-1-4KN for ¼" OD tubing).
3. Snoop Liquid Leak Detector (1 per order).
4. Reusable filter (part #: type 'A' for ¼" OD tubing).
5. 2 hose clamps: 1 for iSOC® barb connection + 1 spare
6. 1 insert: for end of on site tubing. To be inserted prior to connecting tubing to distribution header (part#:SS-405-170)
7. 2 iSOC® repair kits, each consisting of: 1 iSOC® flow-control valve, two hose clamps & 1 direction sheet.
8. 1 spare ferrule set for distribution header Swagelok fitting (part #: NY-400-SET)



***NOTE*:** Part descriptions can be found at www.isocinfo.com

iSOC® Design Options, Installation and O&M Webinar

ITEMS NEEDED TO BE ACQUIRED FOR iSOC® SYSTEM INSTALLATION:

- Single stage low flow regulator (Praxair Prostar regulator part# PRS 23506 or equal)
- Gas cylinder.
- CLEAN ¼" Polyurethane tubing (0.250" OD x 0.167" ID - SMC part # TIUB07).
- If tubing is 6mm OD x 4mm ID (SMC part# TU0604 or equal), filter type 'B' will be necessary. SMC Corp can be found at www.smcworld.com.
- Nylon braided cord for iSOC® lift line.
- Well cap with hole for iSOC® tubing and eyebolt to secure iSOC® lift line.

INSTALLATION STEPS:

1. **Place tape over ends of on site Polyurethane tubing before installation**. The iSOC® and iSOC® flow-control valve barb connections are supplied with vinyl caps covering the openings. Keep caps and tape on all fittings and on site tubing until final connections are made. Caps and tape help to prevent dirt and water from entering the system internally. Note: iSOC® system failure may occur if dirt or water enters the system via on site tubing, iSOC®, iSOC® distribution header or filter.
2. **Make sure all on site tubing is installed correctly.** It should be well protected from being crushed or severed. There should be no tight bends or kinks – see tubing specification for minimum bend radius.
3. **Install gas bottle, regulator and iSOC® distribution header in a clean, dry, well protected area** sheltered from the elements and safe from vandalism.
4. **Crack open new gas cylinder BEFORE attaching regulator** to purge out any debris such as sand and paint chips. Be sure to do so while wearing proper eye protection and making sure there are no open flames or combustibles in the area. Observe OSHA safety guidelines for handling and securing gas cylinders. *Note: Follow same procedure for routine changing of gas cylinders.* ***Failure to perform this procedure may cause iSOC® system failure.***
5. **Attach single stage low flow regulator to gas cylinder**.
6. **Attach iSOC® distribution header to the single stage low flow regulator.**
7. **Close all valves on the iSOC® distribution header.** *Note: Open/close Directions on each valve lever.*
8. **Place stainless steel Swagelok insert into end of onsite tubing (see iSOC® distribution header Swagelok installation instructions).** Swagelok inserts help secure soft polyurethane tubing when used with standard Swagelok tube fittings. Replacements can be found @ www.swagelok.com, part #: SS-405-170.
9. **Connect polyurethane tubing end with insert to iSOC® distribution header Swagelok fitting (see iSOC® distribution header Swagelok installation instructions).**
10. **Turn the regulator counterclockwise to make sure the pressure of the regulator is at zero**. At zero pressure there is no gas flow.
11. **Open gas cylinder valve completely, then back off a slight amount making sure pressure remains at zero**.

KEEP ON SITE WITH DISTRIBUTION HEADER

12. **Set regulator on gas cylinder to 50 psi for immersion depths less than 60 ft (18.3 m) of water.** This will result in 15 - 20 standard cc/min of oxygen delivered to the groundwater by iSOC®. *NOTE:* Pressure settings below 50 psi will result in system failure. At 50 psi, gas usage will be approximately 1.25 cubic foot / iSOC® / day. **For immersion depths greater than 60 ft (18.3 m) of water, it is recommended that the gas cylinder be set at 60 psi.** Increasing of pressure does not necessarily optimize system. *NOTE:* Pressure settings exceeding 70 psi may result in system failure.

13. **VERY IMPORTANT –** Open and then close each valve on the iSOC® distribution header one at a time for a minimum of 15 seconds to purge the regulator, the iSOC® distribution header and each piece of on site tubing of any water or debris following safety guidelines outlined in step 4. ***Failure to perform this procedure may cause iSOC® system failure.***

14. **Attach reusable iSOC® filter to on site polyurethane tubing (arrow indicates direction of gas flow). Attach 6" long piece of polyurethane tubing to opposite end of filter.** Ensure tubing attached to filter is cut squarely and pushed firmly into filter unions (see warning #4 below). Location of filter is **6" above iSOC®** down well. Note: Removal of unions from filter will damage filter.

15. **Attach iSOC® to 6" piece of polyurethane tubing under filter**. Start tubing onto barb at an angle and wiggle or 'walk' it down until entire barb is covered. Avoid kinking the tubing when doing so. Secure iSOC® barb connection with black plastic hose clamp. Pinch hose clamp teeth together using pliers until tight and free of any movement.

16. **Secure lift line (nylon braided cord) to iSOC® eyelet.**

17. **Open valve on iSOC® distribution header and start gas flow to the iSOC® unit.**

18. **Submerge iSOC® unit in a bucket of water**. In 1-2 minutes you should observe one of the following coming from the top hole of the iSOC®: a cluster of bubbles every 1-2 seconds, one large bubble every 5-8 seconds or a steady stream of tiny bubble. *NOTE: The bubble release is normal and is designed to mix D.O. throughout the full vertical extent of the well and release nitrogen assuring good mass transfer.*

19. While iSOC® is in the bucket of water, **use Snoop to test for leaks on all exposed fittings**. Key objective: if any leaks are found, repair before continuing.

20. **Slowly lower the iSOC® into the well at intervals of approximately 20 ft every 5 minutes**. Note: Do not allow nylon braided cord and Polyurethane tubing to wrap around each other. This can cause kinking, cutting, loss of gas flow and possible iSOC® flow control valve replacement.

21. Once the iSOC® is at desired depth in well, **monitor cluster of iSOC® bubbles and regulator pressure gauge for the next 20-30 minutes.** *NOTE: If you are in need of assistance, please call your iTi representative* **while on site** *so that they can help in any of the steps above or any problem you may have encountered. Your iSOC® representative contact information can be found at www.isocinfo.com.*

NOTES:

1. **Removing polyurethane tubing from barb fitting –** Pinch side of tubing at hose barb with pliers only, than pull tubing off barb with fingers. DO NOT score the barb when doing so. DO NOT cut tubing off barb using a knife or damage to the barb may occur resulting in a leak.

WARNINGS:

1. **DO NOT ALLOW GAS CYLINDER TO RUN OUT BETWEEN SITE VISITS. REFER TO GAS USAGE GUIDE IN DESIGN & INSTALLATION OR OPERATIONS & MAINTENANCE SECTIONS OF WWW.ISOCINFO.COM.** Upon failure to maintain gas flow to iSOC® unit, pull iSOC® unit from well, stop gas flow to the iSOC® unit, remove bottom 1/8" hex plug, void iSOC® unit and filter of all water, re-tape and re-install bottom 1/8" hex plug, purge on site tubing of any water or debris following safety guidelines outlined in step 4 and repeat above installation steps 16 to 19.

2. **STORE THE ISOC® UNIT IN A CLEAN, COOL, DRY PLACE.** ****NOTE: iSOC® failure may occur if the iSOC® unit is exposed to temperatures in excess of 60˚ C (140˚ F).*

3. **DO NOT USE ISOC® IN FREE PHASE CHLORINATED ALIPHATIC HYDROCARBON PRODUCT.**

4. **DURING ROUTINE SITE VISITS, ENSURE THE ISOC® FILTER HAS NOT FILLED WITH WATER.** If iSOC® filter has filled with water: 1) Cut tubing squarely 1 inch on either side of filter. 2) Remove remaining tubing pieces from filter union. To do so, push union release button. Then pull the tubing out, keeping release button pressed until tubing is removed. 3) Turn filter upside down and shake out all water. 4) Repeat steps #12 – 20. *NOTE: If filter has become overfilled with water or damaged during down well operation and a bubble cluster is not detected after a few seconds in step # 17, see directions for changing an iSOC® flow control valve.*

iSOC® Technology

Restoring iSOC® Unit after Internal Flooding

The only way an iSOC® unit can be flooded is for the gas flow to the unit to be interrupted. 100% of interruptions are from the gas supply having been depleted or interrupted. Follow the instructions when gas flow has been interrupted.

1. Remove iSOC® unit from well. Check that unit produces a bubble at the rate of approximately one bubble per second when tested in bucket of water. If it does, re-insert in well. If not go to step 2.

2. Stop gas flow to iSOC® unit.

3. Insert supplied 2-prong iSOC® tool into the two holes located at the bottom of the iSOC® unit. While gripping tool, unwind bottom ¼" NPT stainless steel plug using ¼" hex Allan key.

4. Drain all water from bottom of unit. Apply new Teflon tape to the ¼" stainless steel plug and reinsert in bottom of iSOC® unit.

5. Start gas flow to iSOC® unit. Check that unit produces a bubble at the rate of approximately one bubble per second when tested in bucket of water. If it does, reinsert in well. If not go to step 6.

6. The unit will have to go through a 17-day drying period and the iSOC® Flow Control Valve will need to be replaced.

7. Remove the Flow Control Valve per the instruction on the reverse. The water has been drained from the bottom. Be sure to drain all water from the top of the unit. The iSOC® must be air-dried at room temperature for 17 days.

8. At the end of 17 days a new Flow Control Valve must be placed in the unit per the instructions on the reverse side.

9. Repeat iSOC® installation procedure steps #13 to #20. Maintain proper gas quantities and constant feed.

Additional iSOC® supplies can be purchased by contacting the rep in your area.

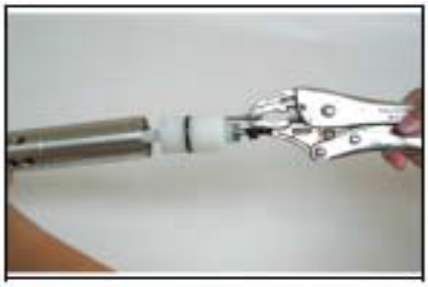
For immediate technical help when removing and/or installing the Flow Control Valve, call your local iSOC® rep or our Technical Hotline at 1-506-462-9080.

iSOC® Technology

Directions for Changing iSOC® Flow Control Valve

Tools needed when changing an iSOC® valve: wire cutters, pliers, protective eyewear and snap ring pliers

Step 1: Cut tubing above barb and remove top snap ring using snap ring pliers. Use protective eyewear when using snap ring pliers



Step 2: Grab iSOC® valve by lifting eye using pliers and gently pull out

Step 3: If valve pulls internal plug out when removed, separate two by hand

Step 4: Wipe interior of iSOC® case using a paper towel or rag. Make sure it is clean from any water or debris

Step 5: If valve internal plug was removed in Step 3, re-insert into iSOC®

Step 6: Lubricate valve o-ring with Vaseline and gently push valve into iSOC® until just past snap ring groove

Step 7: Re-insert snap ring using ring pliers. Follow the iSOC® installation procedure sheet for reinstallation of unit

iSOC® Technology

Installation FAQs

What Equipment does inVentures supply when I order iSOC® equipment?

inVentures supplies the iSOC® units ordered, a distribution header c/w regulator fitting, bleed valve and iSOC® valve connections, Snoop (gas leak detector), a filter and hose clamps.

What equipment do I need in addition to the iSOC®s?

You will need a dual stage low flow pressure regulator to connect to the gas tank to control the flow of gases to the iSOC® Distribution Header. You will also need the appropriate amount of tubing to connect the iSOC® Distribution Header and iSOC®s. The tubing should be standard polyethylene tubing rated to 100 psi (7 Bar) and have an interior dimension of 0.17 inches (4mm).

What is the most common mistake made when installing iSOC®?

The installers often do not read or do not receive the four-page technology brochure or the installation instructions that accompany each order. Reading the installation papers in the Installation and Design section at www.isocinfo.com will facilitate the proper use of the equipment and reduce on-site time for proper installation and function of the iSOC® installation.

What is the second most common mistake in the installation process?

Installers often forget to tape the ends of the tubes and get dirt particles in the system. Dirt particles may likely foul the flow control valve, which can cause under-performance of the iSOC®.

What is the most common mistake in the operation of the iSOC® system?

The operators place too small a margin of error on gas replacement thereby possibly flooding the system. Not all gas bottles get filled to their maximum and the flow controllers are accurate to +/- five percent. It is easier and cheaper to change gas bottles rather than have the system flooded and not running, thereby not doing its remediation function.

What procedures should I follow to connect the gas tank and regulator to the iSOC® Distribution Header?

Prior to hooking the gas supply to the regulator and to the iSOC® Distribution Header crack the tank valve and purge and dirt or paint chips; make sure that the gas supply is turned on (valve on the top of the tank) and the regulator is turned off by turning the “T” handle on the face of the regulator counter clockwise. Then turn the handle of the regulator in a clockwise direction can gradually increase pressure

How do I connect the iSOC®s to the iSOC® Distribution Header?

Simply ensure that the tubing is cut square using a sharp knife or a tube cutter and place the end of the tube over the barbed connector and work it into position.

How do I remove the tubing from the barbed connectors on the iSOC® and the iSOC® Distribution Header?

Using a small pair of pliers, simply squeeze the edge of the tube and it will come away from the connector with ease. Do NOT cut the tubing off the connector as scoring the barbs may cause leak pathways in future use.

How do I connect the iSOC®s to the iSOC® Filter?

Simply ensure that the tubing is cut square using a sharp knife or a tube cutter and place the end of the tube into the push-lock connector.

How do I remove the tubing from the to the iSOC® Filter?

Simply depress the push-lock rim in completely and gently pull the tubing. Any tubing removed from a push-lock connector should be re-cut before reinserting tubing into a push-lock connector.

Are the iSOC®s, iSOC® Distribution Headers and iSOC® Filters tested for leaks prior to being shipped?

Yes. Both go through a rigorous QA/QC procedure and are tested for leaks both hydrostatically and with bubble tests.

Should I test for leaks after installation?

Yes. Using “Snoop” included in the iSOC® equipment package, the regulator, the connection to regulator and the connections to the iSOC® Distribution Header and iSOC®s should be leak tested with the gas on at operating pressure. If there are any splices in the lines, these should be tested.

Does it matter whether the gas tubing is kinked or damaged?

Damaged or kinked tubing can be source of a gas leak and will cause the gas bottle to empty prematurely. Care should be taken not to entangle the tubing with the suspension line.

With what type of line do I suspend an iSOC® in the infusion well?

Using a nylon line or vinyl coated steel line, tie the line to the iSOC® lifting ring on the top of the unit and lower the unit in the well, securing the line to the top of the well when complete. Do not use a braided steel line, as the high concentrations of dissolved oxygen will cause it to rust and possibly fail.

iSOC® Distribution Header:

- Use polyurethane tubing to connect the regulator/iSOC® Distribution Header to the iSOC® making sure that the gas bottle has been cracked to avoid dirt or paint chips getting in the regulator or lines to the iSOC®.

- Make sure that the tubing ends have been taped to prevent dirt in the lines as they are being installed.

- Then
  1) Turn the regulator adjustment counterclockwise to zero.
  2) Open the gas valve completely on the gas cylinder.
  3) Adjust the regulator pressure to 50 psi (3.4 Bar) for water depths of less than 60 feet (18.2 m)
  4) Refer to Installation and Design – Installation Instructions at: www.isocinfo.com

How To Attach & Remove Polyurethane Tubing to barbs:

- Please follow these steps when attaching and removing the tubing to the barbed fittings located on the iSOC® unit and iSOC® Distribution Header.
  1. Make sure the tubing is cut square
  2. The polyurethane tubing should slide onto the barbed fillings fairly easy. If difficult, place end of tubing in hot water. Then wiggle or walk the tubing down the barbed fitting.
  3. Test all connections with **SNOOP** leak solution (A bottle is included in each shipment of the iSOC® Distribution Header). To remove tubing do not cut tubing away from barbed fittings (Damage can be done to the 360° rings). To remove, use pliers to pinch the side of the tubing and then gently wiggle to deform the tubing.

How To Attach & Remove Polyurethane Tubing to iSOC® Filter:

- Please follow these steps when attaching and removing the tubing to the iSOC® Filter.
  1. Make sure the tubing is cut square
  2. The rim of the push-lock connector should be depressed when inserting or removing tubing
  3. Push in until the tubing stops when inserting
  4. Pull tubing gently while the rim is depressed when removing tubing.
  5. Always use a fresh cut tube for insertion

iSOC® System Parts & Accessories

iSOC® Unit:

- The iSOC® unit is made of stainless steel and measures 1.62 inches (41mm) by 12.5 inches (318mm).

iSOC® Tubing: (Polyurethane)

- To connect the iSOC® Distribution Header and the iSOC® unit together you must use a 0.25" (or 6 mm) OD and a 0.17"(or 4 mm) ID polyurethane tube (Use natural color).

Barbed fittings:

- The barbed fittings on the iSOC® and iSOC® Distribution Header are 0.110" (3 mm) ID and 0.195" (5 mm) OD.
- It is rated for pressures up to 110 PSI (7 bar) when used with 1/4" (or 6 mm) OD tubing.

Two Stage Low Flow Gas Regulator:

- You will need a two-stage low flow regulator (2-50 psi or 0.12 – 3.4 bar) for each gas cylinder.
- They are used for maintaining constant pressure flow.
- Gas supply companies such as Holox and Air Gas can order them.
- Harris Model #92-96-50-540; Part #3302603) and Victor Model #VTS250B-540; Part #0781-3504).
- Be sure to order the correct fitting: (#540-Oxygen; #510-Propane; #350-Methane).
- You can save money by utilizing a manifold to pigtail in 3-4 gas cylinders.

(**Note:** The iSOC® Distribution Header has an attachment for the gas regulator)

iSOC® Distribution Header:

- Depending on the system design configuration, the Distribution Header can feed from one to eight iSOC®s with gas.
- Typically, one regulator will be used with one Distribution Header, but they headers may be manifolded.

iSOC® Filter:

- The iSOC® Filter come equipped with push-lock connector for either 0.25 inch or 6 mm OD polyurethane tubing. Tubing size should be specified at time of order.

Lifting Wire:

- Avoid exposed wire. Use rubber coated wire or nylon line.

Gas Cylinders:

- They typically rent for $15.00/per month, plus $0.15/per day (or about $20.00/month, regardless of size).

Oxygen Consumption:

- Each iSOC® is preset to put 16 cc/minutes of gas into the groundwater. Increasing pressure at the regulator can vary this.
- With a factor of safety built in for flow controller variance and gas tanks that may not be filled to 1005 of their capacity, the iSOC® will consume one cubic foot of oxygen per day.

How Long Gas Cylinders Will Last?

- 40 cu. ft (1.13 m^3) cylinder (7 x 18) will last approximately 40 days/per iSOC®
- 80 cu. ft (2.26 m^3) cylinder (7 x 32) will last approximately 80 days/per iSOC®
- 150 cu. (4.25m^3) ft cylinder (8 x 48) will last approximately 150 days/per iSOC®
- 220 cu. ft (6.23 m^3) cylinder (9 x 51) will last approximately 220 days/per iSOC®

Storage Compound:

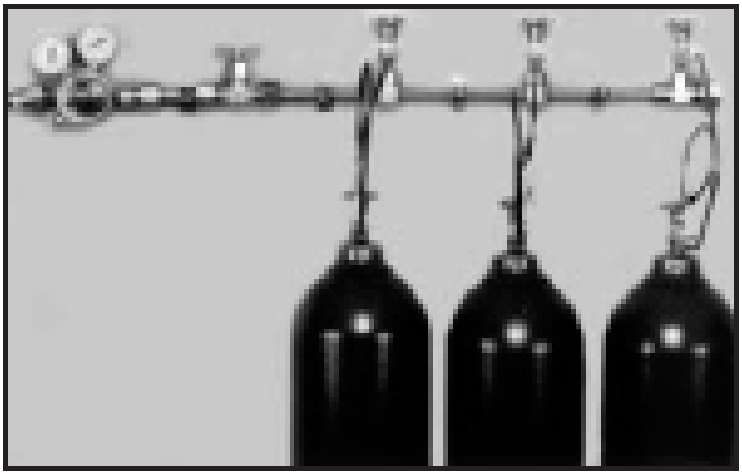
- Depending on your site conditions, you may want to place the oxygen cylinder / regulator / iSOC® Distribution Header inside a secure building or shed.
- Other options include above ground compartments and below ground vaults.

High Range DO Meter:

- You will need a special high range DO meter.
- We highly recommend the “The OxyGuard Handy” which measures both ppm (mg/l) and % of saturation.
- For a sales quotation, go to www.pointfour.com or call 1-604-273-9939. (It measures oxygen only). The meter can be used on multiple sites.

Gas Manifold:

Victor gas manifolds allow for 3, 4, 6 or more gas cylinders to be connected together. This is especially useful at iSOC® sites where a large volume of gas is used or for remote iSOC® sites where the monthly labor costs for the gas cylinder change out activities far exceed the gas rental rates. The manifold has 24" flexible pigtails to connect to the gas cylinders. The tanks all under the same pressure, and consequently drain at the same rate.



(3 valves, connector and 24" pigtails, above)

Victor "SIMPLEX-type" manifold system (other models- please call)

- 3-cylinder manifold: Victor #1130-0920
- 4-cylinder manifold: Victor #1130-0919
- 6-cylinder manifold: Victor #1132-0245
- 8-cylinder manifold: Victor #1132-01614

Automatic Switchover Manifold:

The Victor Automatic Switchover Manifold Kit changes between primary side of cylinders and the secondary side using the pressure differential between the two sides of high pressure gas supply. The PDS 600 is designed to continuously supply the iSOC with high purity gas from two individual cylinders or entire banks of cylinders manifolded together. The PDS 600 is designed with an outlent regulator to maintain a constant iSOC pressure. Switchover pressures (200 psig right to left; 165 psig left to right). The PDS 600 is chrome plated on brass construction.

PDS 600 Automatic Switchover Manifold:

- PDS 600 Kit: 2 tanks (1 left, 1 right)
- PDS 600 Kit: 4 tanks (2 left, 2 right)
- PDS 600 Kit: 8 tanks (4 left, 4 right)

Pressure Alarm and Pressure Switch System Kit:

Victor's remote alarm systems are designed to provide warning of service interruption when used on Victor manifolds. Used in conjunction with a pressure switch, the alarm system will provide both a visual or audio/visual warning of cylinder depletion for one or two gas manifold systems. Once activated, a visual only alarm will change from "green" indicator for normal operation to a "red" indicator for depleted cylinders. This is not an auto-dialer unit. The alarm has a 90 DB buzzer that is wired into the unit. The pressure switch (one for each header); are designed to activate remote alarm systems on Victor manifold systems. Once the minimum pressure is reached, the pressure switch will activate the remote alarm upon depletion.

Remote Alarm System (left)

Pressure Switch (right)

Remote Alarm System (left) and Pressure Switch

(NOTES: The regulators and other gas equipment are for oxygen. There may be a higher price for other gases (propane, butane, hydrogen, methane).

Contact info@inventures.ca for information regarding sourcing and pricing for gas manifolds, automatic switchover manifolds and remote alarms and pressure switchs.

www.isocinfo.com

Attachment C

System Datasheets

System Startup Datasheet

Date: _____ **Field Tech: _____** **Start Time: _____** **End Time: _____**

Oxygen Level Monitoring

	Floor Level	Breathing Level	Max Elevation
Inside Enclosure (%)			
Outside Enclosure (%)			

Compressed Oxygen Cylinder Gauges

Cylinder Pressure Regulator Gauge	Pressure Reading (psi)	Cylinder Feed Pressure Gauge	Pressure Reading (psi)	Comments
PI-101A		PI-101A		
PI-102A		PI-102A		
PI-103A		PI-103A		
PI-104A		PI-104A		
PI-105A		PI-105A		
PI-106A		PI-106A		

Injection Leg Manifold

Flowmeter Rotometer	Initial Flow Rate (cc/min)	Final Flow Rate (cc/min)	Injection Leg Ball Valve	Initial State (% Open)	Final State (% Open)	Injection Leg Outlet Pressure Gauge	Final Pressure Reading (psi)
FM-201	0		BV-201	0		PI-201	
FM-202	0		BV-202	0		PI-202	
FM-203	0		BV-203	0		PI-203	
FM-204	0		BV-204	0		PI-204	
FM-205	0		BV-205	0		PI-205	
FM-206	0		BV-206	0		PI-206	
FM-207	0		BV-207	0		PI-207	
FM-208	0		BV-208	0		PI-208	
FM-209	0		BV-209	0		PI-209	
FM-210	0		BV-210	0		PI-210	
Comments							

Maintenance Log Form
Mt Vernon Works
Mt Vernon, NY

Date	Time	Field Tech.	Item	Problem	Repair Work Performed

Sampling Order:

Well ID:

Low Flow Ground Water Sample Collection Record

Client: _____ Date: _____ Time: Start _____ am/pm
Project No: _____ Finish _____ am/pm
Site Location: _____
Weather Conds: _____ Collector(s): _____

1. WATER LEVEL DATA: (measured from Top of Casing)

a. Total Well Length _____ c. Length of Water Column _____ (a-b) Screen Depth: _____

b. Water Table Depth _____ d. Casing Diameter/Material _____

2. WELL PURGE DATA

a. Purge Method: _____ Well Volume: _____ Purge Volume: _____

b. Acceptance Criteria defined (see workplan)

- Temperature ±3% - D.O. ±10% or ± 0.5 mg/l
- pH ± 0.1 unit - ORP ± 10mV
- Sp. Cond. ±3% - Drawdown < 0.3' -Turbidity ±10% for values >1 NTU

c. Field Testing Equipment used: Make Model Serial Number

_____
_____
_____

Time (24hr)	Temp. (°C)	Spec. Cond. (µS/cm)	DO (mg/l)	pH	ORP (mV)	Turbidity (NTU)	Volume Removed (Liters)	Flow Rate (ml/min)	Drawdown (feet)	Color/Odor

d. Acceptance criteria pass/fail Yes No N/A (continued on back)

Has required turbidity been reached ☐ ☐ ☐
Have parameters stabilized ☐ ☐ ☐

If no or N/A - Explain below.

_____

3. SAMPLE COLLECTION: Method: _____

Sample ID Container Type No. of Containers Preservation Analysis Req. Time

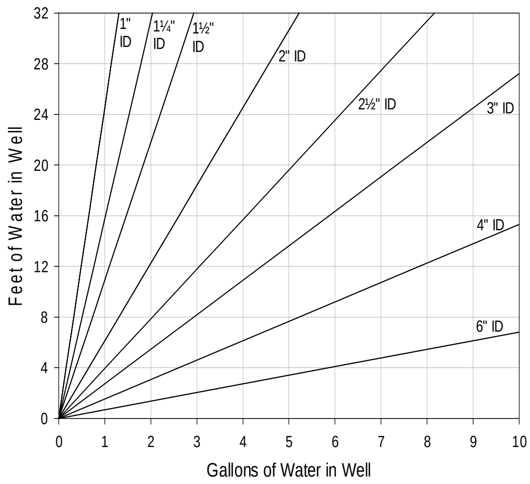
_____
_____
_____
_____
_____
_____
_____

Comments _____

_____

Signature _____ Date _____

Purge Volume Calculation



Volume / Linear Ft. of Pipe		
ID (in)	Gallon	Liter
0.25	0.0025	0.0097
0.375	0.0057	0.0217
0.5	0.0102	0.0386
0.75	0.0229	0.0869
1	0.0408	0.1544
1.25	0.0637	0.2413
1.5	0.0918	0.3475
2	0.1632	0.6178
2.5	0.2550	0.9653
3	0.3672	1.3900
4	0.6528	2.4711
6	1.4688	5.5600

(continued from front)

Time (24 hr)	Volume Removed (Liters)	Temp (°C)	pH	Spec. Cond. (μS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Flow Rate (ml/min)	Drawdown (ft)	Color/Odor

System Checkup Datasheet

Date: _____ **Field Tech: _____** **Start Time: _____** **End Time: _____**

Oxygen Level Monitoring

	Floor Level	Breathing Level	Max Elevation
Inside Enclosure (%)			
Outside Enclosure (%)			

Compressed Oxygen Cylinder Gauges

Cylinder Pressure Regulator Gauge	Pressure Reading (psi)	Cylinder Feed Pressure Gauge	Pressure Reading (psi)	Comments
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PI-102A		PI-102A		
PI-103A		PI-103A		
PI-104A		PI-104A		
PI-105A		PI-105A		
PI-106A		PI-106A		

Injection Leg Manifold

Flowmeter Rotometer	Initial Flow Rate (cc/min)	Final Flow Rate (cc/min)	Injection Leg Ball Valve	Initial State (% Open)	Final State (% Open)	Injection Leg Outlet Pressure Gauge	Initial Pressure Reading (psi)	Final Pressure Reading (psi)
FM-201			BV-201			PI-201		
FM-202			BV-202			PI-202		
FM-203			BV-203			PI-203		
FM-204			BV-204			PI-204		
FM-205			BV-205			PI-205		
FM-206			BV-206			PI-206		
FM-207			BV-207			PI-207		
FM-208			BV-208			PI-208		
FM-209			BV-209			PI-209		
FM-210			BV-210			PI-210		
Comments								