

REPORT ON
30% REMEDIAL DESIGN
FORMER NUHART PLASTIC MANUFACTURING SITE OU-1
BROOKLYN, KINGS COUNTY, NEW YORK
NYSDEC SITE #2-24136

by
Haley & Aldrich of New York
Rochester, New York

for
New York State Department of Environmental Conservation
Albany, New York

File No. 203497-000
April 2022





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1 April 2022
File No. 0203497-000

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21st Street
Long Island City, New York 1110

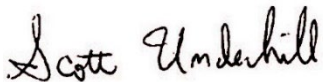
Attention: Mr. Bryan Wong

Subject: 30% Remedial Design
Former NuHart Plastics Manufacturing Site OU-1
NYSDEC Site #224136
Brooklyn, New York

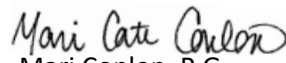
Dear Mr. Wong:

Haley & Aldrich of New York (Haley & Aldrich) is pleased to present this 30% Remedial Design on behalf of Dupont Street 1 LLC for the above referenced Site. This submission includes the proposed partial remedy details for the Site which will continue to be refined in the forthcoming 60% and 90% Remedial Design submittals and pending comments from the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH). Should you have any questions please do not hesitate to contact the undersigned at 646-518-7735.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK


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ENGINEERING CERTIFICATION

I hereby certify that the Remedial Design Report for the Former NuHart Plastic Manufacturing OU-1 Site was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the New York State Department of Environmental Conservation Division of Remediation (DER) Technical Guidance for Site Investigation and Remediation (DER-10).

Respectfully submitted,

FINAL VERSION TO BE CERTIFIED

Scott Underhill
Registered Professional Engineer
New York License No. 075332

Date

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C-300	Excavation Plan
C-301	Waste Characterization Plan
C-302	LNAPL Barrier/LNAPL Recovery Plan
C-303	VOC Groundwater Treatment Plan
C-304	Sub-Slab Depressurization System Plan
C-400	Site Restoration Plan
C-500	Details Sheet

List of Attachments (to be provided with 60% Submittal)

Attachment No.	Title
1	Technical Specifications

List of Appendices (to be provided with 60% Submittal, with the exception of the Project Schedule, included in Appendix J)

Appendix	Title
A	Organizational Chart

B Citizens Participation Plan

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D Support of Excavation Plan

E Community Air Monitoring Plan

F Health and Safety Plan

G Construction Contingency Plan

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I Quality Assurance Project Plan

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List of Acronyms and Abbreviations

<u>Acronym/Abbreviation</u>	<u>Definition</u>
°C	degrees Celsius
AS/SVE	Air Sparge/Soil Vapor Extraction
ASP	Analytical Services Protocol
bgs	below ground surface
CAMP	Community Air Monitoring Plan
CP	Commissioner Policy
cu yd	cubic yard
CVOC	Chlorinated Volatile Organic Compound
DER	Division of Environmental Remediation
DOT	U.S. Department of Transportation
DUSR	Data Usability Summary Report
EC	Engineering Control
EDD	Electronic Data Deliverable
El.	elevation
ELAP	Environmental Laboratory Accreditation Program
FER	Final Engineering Report
FS	Feasibility Study
HASP	Health and Safety Plan
HVAC	Heating, Ventilation, and Air Conditioning
IC	Institutional Control
IRM	Interim Remedial Measure
ISCO	In-Situ Chemical Oxidation
LNAPL	Light Non-aqueous Phase Liquid
LSDF	Low-Sulfur Diesel Fuel
mg/m ³	milligrams per cubic meter
NYCDEP	New York City Department of Environmental Protection
NYCDOT	New York City Department of Transportation
NYCRR	New York Codes, Rules, and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
OSHA	Occupational Safety and Health Act or Administration
OU	Operable Unit
PCB	Polychlorinated Biphenyl
PSB	Petroleum Bulk Storage
PDI	Pre-Design Investigation
PFAS	per- and polyfluoroalkyl substances
PGWSCO	Protection of Groundwater Soil Cleanup Objectives
PID	Photoionization Detector
PPE	Personal Protective Equipment
ppm	parts per million
PVC	Polyvinyl Chloride

List of Acronyms and Abbreviations (continued)

<u>Acronym/Abbreviation</u>	<u>Definition</u>
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
REC	Renewable Energy Credit
RI	Remedial Investigation
ROD	Record of Decision
RRSCO	Restricted Residential Soil Cleanup Objective
SCO	Soil Cleanup Objective
SMP	Site Management Plan
SOE	Support of Excavation
SPDES	State Pollutant Discharge Elimination System
sq ft	square feet
SSDS	Sub-Slab Depressurization System
SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compound
TCE	Trichloroethene
UST	Underground Storage Tank
UUSCO	Unrestricted Use Soil Cleanup Objective
VOC	Volatile Organic Compound
ZVI	Zero Valent Iron

1. Introduction

This Remedial Design Report describes mobilization and site preparation, excavation of on-site source areas, installation of a light non-aqueous phase liquid (LNAPL) barrier, LNAPL recovery wells, groundwater treatment via air sparge/soil vapor extraction (AS/SVE), waste management, and site restoration associated with the Former NuHart Plastic Manufacturing site (the "Site") located in Brooklyn, Kings County, New York. This project is being proposed in accordance with the New York State Department of Environmental Conservation (NYSDEC) issued Record of Decision (ROD) for the Site dated March 2019.

The Site components are explained in this Remedial Design Report and include:

- The existing on-site building(s) will be demolished, and materials which cannot be beneficially reused on Site will be taken off Site for proper disposal in order to implement the remedy. Excavation and off-site disposal of contaminant source areas, including:
 - Grossly contaminated soil as defined in New York Codes, Rules, and Regulations (6NYCRR) Part 375-1.2(u);
 - Concentrated soil or semi-solid hazardous substance per 6 NYCRR Part 375-1.2(au);
 - LNAPL;
 - Soil with visual waste material or LNAPL;
 - Soil which exceeds the protection of groundwater soil cleanup objectives (PGWSCOs), as defined by 6 NYCRR Part 375-6.8 for those contaminants found in the Site groundwater above standards;
 - Soil that creates a nuisance condition, as defined in Commissioner Policy CP-51 section G;
 - Grossly contaminated soil that may be present in proximity to the underground storage tanks (USTs) and piping trench systems formerly used to store and convey phthalates and lubricating oil during the former plastic manufacturing process;
 - Volatile organic compound (VOC)-impacted soil that is above the water table in the northeastern corner of the Site; and
 - Excavation and removal of any USTs, fuel dispensers, underground piping, or other structures associated with a source of contamination.
- Clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) will be brought in to replace the excavated soil and/or to complete backfilling of the excavation and establish the designed grades at the Site.
- Installation of two physical barriers to support the on-site excavation and prevent further off-site LNAPL migration.
 - Shoring will be installed as a physical barrier around the entire perimeter of the on-site excavation area down to approximately 30 feet below grade.

- Installation of a physical barrier to prevent LNAPL migration onto the off-site property located to the southwest of the Site.
- Installation and operation of a network of recovery wells located off-site to recover mobile LNAPL from the subsurface. The 6-inch recovery wells will be installed with a 10-ft screen installed across the groundwater interface where LNAPL is present. The recovery wells will be spaced approximately 30 feet apart with the sidewalk areas where LNAPL has been detected in the past.
- Air sparging will be implemented to address the groundwater plume contaminated by VOCs identified in the northeast portion of the Site and in the downgradient vicinity of the Site. VOCs will be physically removed from the groundwater and soil below the water table (saturated soil) by injecting air into the subsurface. The injected air rising through the groundwater will volatilize and transfer the VOCs from the groundwater and/or soil into the injected air. The VOCs are carried with the injected air into the vadose zone (the area below the ground surface but above the water table) where a SVE system, designed to remove the injected air, will be installed. The SVE system will apply a vacuum to wells that have been installed into the vadose zone to remove the VOCs along with the air introduced by the air sparging process. The air extracted from the SVE wells will be treated as necessary prior to being discharged to the atmosphere.
- Any on-site and off-site buildings, pending access and approval from third parties, impacted by the contaminants migrating from the Site will be required to have a sub-slab depressurization system (SSDS), or other acceptable measure, to mitigate the migration of vapors into the building from soil or groundwater. The SSDS will be installed in the buildings to be constructed at the Site.

The remedial action will be performed under the approval and oversight of the NYSDEC and the New York State Department of Health (NYSDOH).

1.1 SITE LOCATION AND DESCRIPTION

Location: The Site is located at 280 Franklin Street in the Greenpoint section of Brooklyn, Kings County, New York. The approximately one-acre Site is identified on the tax map as Block 2487, Lots 1, 10, 12, 72, and 78. The Site is bordered immediately to the north by Clay Street followed by commercial/industrial buildings, to the east by remaining portions of the NuHart Plastic Manufacturing facility (currently enrolled in the Brownfield Cleanup Program and not associated with this NYS Inactive Hazardous Waste Disposal Site at OU-1), to the south by Dupont Street followed by multi-family residential structures, and to the west by Franklin Street followed by a New York City playground.

Features: The dimensions of the Site are approximately 240 feet by 200 feet. The Site is currently covered by a complex of industrial buildings that were constructed at different times, though these buildings will be razed to the concrete slab flooring prior initiating this remedial action.

Current Zoning: The Site is zoned M1-2/R6, which designates the Site as manufacturing with a residential overlay. The on-site building is currently vacant.

Operable Units: An operable unit (OU) represents a portion of the Site remedy that for technical or administrative reasons can be addressed separately to eliminate or mitigate a release, threat of release, or exposure pathway resulting from the Site contamination. The Site was divided into two OUs. OU-1 is the on-site source area and associated contamination. OU-2 consists of the off-site groundwater and soil vapor plumes.

Site Geology and Hydrogeology: Soil at the Site consists of a layer of urban fill extending from the surface to about 8 feet below the on-site slab, underlain by sand, silty sand, and/or sandy silt. Groundwater is encountered at a depth of approximately 10 to 15 feet below ground surface (bgs) and flows generally in a westerly to northwesterly direction toward the East River.

1.2 SITE HISTORY

The Site was developed in the 1800s and was used for manufacturing purposes, until circa 1950, for various industries including metal-working and manufacturing of light fixtures, soap, and water-proofing materials. From 1950 until 2004, the Site and associated manufacturing buildings to the east were used for production, storage, and shipping of plastic and vinyl products. Operations ceased in 2004, and the Site buildings have not been used since that time. Redevelopment of the Site and associated former NuHart buildings to the east is being contemplated. Redevelopment of the Site is anticipated to include restricted residential and/or commercial uses.

1.3 PREVIOUS INVESTIGATIONS AND REMEDIAL ACTIONS

Between 2007 and 2015, the Site has been subject to several investigations as listed below.

1. Phase II Site Assessment, 49-55 Dupont Street, Brooklyn, NY 11222, NYSDEC Spill #06-01852. Advanced Site Restoration, LLC. March 2007.
2. Remedial Investigation Report, Former NuHart Plastic Manufacturing Site, 280 Franklin Street, Brooklyn, New York. EcoSystems Strategies, Inc. 30 July 2015.
3. Supplemental Remedial Investigation Report, Former NuHart Plastic Manufacturing Site, 280 Franklin Street, Brooklyn, New York, NYSDEC Site #224136. FPM Group. October 2015.
4. Test Pit Report, Former NuHart Plastic Manufacturing Site, NYSDEC #224136, 280 Franklin Street, Brooklyn, New York. FPM Group. 28 May 2015.
5. Product Testing Report, Former NuHart Plastic Manufacturing Site, NYSDEC #224136, 280 Franklin Street, Brooklyn, New York. FPM Group. 23 February 2015.
6. Feasibility Study for Former NuHart Plastic Manufacturing Site, 280 Franklin Street, Brooklyn, New York. NYSDEC #224136. FPM Group. April 2016.
7. Feasibility Study for Former NuHart Plastic Manufacturing Site, 280 Franklin Street, Brooklyn, New York. NYSDEC #224136. GZA GeoEnvironmental of New York. August 2016.

The documents associated with these investigations and reports are available for public review at the following document repositories:

Brooklyn Community Board No. 1
435 Graham Avenue
Brooklyn, New York 11211
Phone: 718.389.0009

NYSDEC Region 2 Headquarters
Attn: Bryan Wong
47-40 21st Street
Long Island City, New York 11101
Phone: 718.482.4905

North Brooklyn Development Corporation
148-150 Huron Street
Brooklyn, New York 11222
Phone: 718.349.9044

1.3.1 Previous Interim Remedial Measures

Seventeen USTs and associated sub-grade pipe trenches were cleaned out and closed-in-place in 2006; this work was reported to the NYSDEC. The tanks included 8 USTs formerly containing plasticizers (phthalates) and 4 USTs containing "Super Hecla" oil (a heavy-weight machine lubricant) located on-site and 5 USTs (3 fuel oil tanks and 2 chemical tanks containing methyl tert-butyl ketone and acetone) located off-site to the east in the associated NuHart manufacturing buildings. Spill #0601852 was reported to the NYSDEC for a petroleum release associated with the fuel oil USTs.

LNAPL recovery has been ongoing since 2006 as an Interim Remedial Measure (IRM). LNAPL is removed from several wells within and in proximity to the Site building and is transported for off-site disposal. LNAPL recovery appears to be limited by its moderate to high viscosity.

Groundwater monitoring has been performed for petroleum compounds and phthalates, although recent monitoring events have included chlorinated volatile organic compounds (CVOCs).

2. Remedial Action Objectives

In accordance with the ROD, the remedial objectives for the Site are:

2.1 PUBLIC HEALTH PROTECTION

Groundwater:

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
- Prevent contact with or inhalation of volatiles from contaminated groundwater.

Soil:

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

Soil Vapor:

- Mitigate impacts to public health resulting from existing, or the potential for soil vapor intrusion into buildings at the Site.

2.2 ENVIRONMENTAL PROTECTION

Groundwater:

- Remove the source of groundwater contamination, to the extent feasible.
- Restore the groundwater aquifer to pre-disposal/pre-release conditions, to the extent feasible.

Soil:

- Prevent migration of contaminants that would result in groundwater contamination, to the extent feasible.

3. Organizational Structure and Responsibility

=Dupont Street 1, LLC has the ultimate responsibility for implementing the remedial action for the project, and the community air monitoring program during construction (see Organizational Chart in Appendix A). Approval of this Remedial Design Report by the NYSDEC and the NYSDOH will be secured prior to intrusive activities. NYSDEC and NYSDOH personnel are anticipated to be on Site periodically for the purposes of general program oversight.

The remediation Contractor will be responsible for all on-site construction operations during the project, unless otherwise stated herein, including:

- Utility re-location, sheet pile installation, excavation, and in-situ chemical oxidation (ISCO) implementation, and protection of adjacent structures and utilities;
- Construction personnel health and safety;
- Traffic management and safety;
- Implementation of contingency plans for odor control;
- Management of wastewater and waste-handling operations;
- Maintenance of Site controls (i.e., run-off, run-on);
- The construction and material handling activities associated with the remedial action; and
- Documentation of the extent of the removal action.

Key personnel and their assigned responsibilities for implementation of the remedial action include:

DEVELOPER: Dupont Street 1 LLC
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Phone: 516.698.9547

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NYSDOH: Stephen Lawrence
NYSDOH
Empire State Plaza
Corning Tower, Room 1787
Albany, New York 12237
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4. Remedial Design

4.1 SUMMARY OF REMEDIAL ACTIVITIES

The primary activities covered under this Remedial Design, as outlined in the ROD, include:

- Mobilization and Site preparation;
- Erection of a temporary structure over the work area;
- Excavation of contaminated source areas within the temporary structure;
- Off-site treatment and disposal of excavated materials at appropriate, permitted facilities;
- Backfill with clean fill meeting the requirements of 6 NYCRR Part 375-6.7(d) to replace excavated soil and establish the design grades at the Site;
- Installation of sheet piling to act as a LNAPL barrier around the perimeter of the Site and at the off-site property located southwest of the Site;
- Installation of a cover system to allow for restricted residential use of the Site in areas where the upper two feet of exposed surface soil will exceed the applicable soil cleanup objectives (SCOs);
- Installation of a network of recovery wells located in OU-2 to recover LNAPL from the subsurface;
- Installation of a groundwater treatment system to address the on-site dissolved phase groundwater plume;
- Installation of a SSDS below the on-site buildings to mitigate the migration of vapors into the building from soil or groundwater; and
- Site restoration.

The remainder of this section describes these activities and provides the information used as the basis for the design. Additional specific instructions to the remediation Contractor are provided in the Specifications and Drawings.

4.2 MOBILIZATION AND SITE PREPARATION

The Contractor will prepare the Site for the required excavation and ISCO work. Note separate mobilizations by different contractors may be required for the excavation work and for the ISCO work. Site preparation activities include:

- Mobilization;
- Installation of erosion and sedimentation controls;
- Set-up of temporary Site facilities;
- Utility location, protection, and relocation, if necessary;
- Emergency access development; and

- Set up of traffic management at the project Site.

4.2.1 Mobilization

The Contractor will mobilize to the Site all necessary labor, equipment, and materials to initiate the work. The initial mobilization will include the delivery of the materials and equipment for Site preparation. This will be followed by delivery of equipment and materials needed for the excavation and ISCO work.

4.2.2 Erosion and Sediment Controls

Erosion and sediment controls, including silt fencing, will be installed prior to any disruption of Site soil. The erosion and sediment controls will be maintained throughout the duration of the work. Erosion and sediment controls are further described in Section 4.8.3.

4.2.3 Clearing and Placement of Site Facilities

The Contractor will set up Site facilities needed to support and execute the work. Fencing, trees, and other surface features that impede access to the excavation area will be removed. The following Site facilities will be needed during remedial construction:

- Construction offices;
- Utilities (electric, water, sewer, and telephone);
- Community air monitoring equipment;
- Lighting;
- Security fencing;
- Fuel storage and dispensing;
- Sanitary facilities;
- Temporary fabric structure;
- Temporary construction entrances;
- Decontamination pad(s);
- Health and safety equipment;
- Material laydown areas;
- Soil stockpile areas;
- Traffic control signage; and
- Parking areas.

In addition to the above facilities, all work areas will be secured and barricaded with temporary fencing and caution tape to ensure the safety of the workers, visitors, and surrounding public, as well as to prevent vandalism and unauthorized access. The fencing will have professionally made signs stating that access to

the Site is limited to authorized personnel, and work within the Site must be performed with the appropriate personal protective equipment (PPE).

Work zones will be established within the Site boundaries in accordance with the Site-specific Health and Safety Plan (HASP) that will define the initial exclusion zones, the decontamination zones, and the support zone. These zones will change as the work progresses to maintain safety and allow for practical completion of the work.

4.2.4 Protection of Utilities

The Contractor will identify and protect all utilities within the project work areas. Where necessary, utilities will be removed, relocated, and replaced at the direction or to the satisfaction of the Engineer.

4.2.5 Traffic Management

All project traffic is to follow the Site transportation route identified in the Transportation Plan (Appendix C).

4.3 EXCAVATION

The objective of this excavation is to remove the on-site contaminant source materials, which include:

- Soil impacted by phthalates on Site where LNAPL is present. Soil impacted by phthalates is also likely to be associated with some of the on-site USTs and piping system formerly used to store and manage phthalates and Hecla oil when the facility was operating. These impacts to soil are generally found at depths from approximately 8 to 10 feet bgs.
- LNAPL containing phthalates and Hecla oil floating on the groundwater surface beneath the western portion of the Site. The LNAPL-impacted interval ranges from 0.5 to 2 feet thick and is generally encountered between 13 and 17 feet bgs.
- Soil impacted by trichloroethene (TCE) and related chlorinated solvents present in a “hot spot” area in the northeastern portion of the Site. The impacted soil has been identified at depths from approximately 10 to 25 feet bgs.
- Soil impacted by several metals (e.g., chromium, iron, nickel, selenium, and zinc) is present on Site. These impacts are related to materials in the historic fill identified on the Site and are characteristic of historic fill commonly found in the New York City metropolitan area. Historic fill extends to depths of approximately 10 to 12 feet bgs.

The horizontal limits of the excavation encompass an area of approximately 49,800 square feet (sq ft), or almost the entire footprint of the Site. The excavation will be performed within the sheet pile support of excavation (SOE) down to elevation (El.) -4.5, or a depth of approximately 16 feet bgs. The volume of soil to be removed is approximately 29,500 cubic yards (cu yd).

4.3.1 UST Removal

In 2006, 17 USTs and associated sub-grade pipe trenches were cleaned, rinsed, and filled with foam (Polymaster R-501) to achieve closure-in-place in accordance with NYSDEC regulations. These tanks and

associated appurtenances that have been properly cleaned will be removed, and if they not able to be recycled due to the presence of foam, they will be disposed of as construction debris. Undocumented USTs and/or associated appurtenances (e.g., fill lines, vent lines, and electrical conduit), if encountered, will be decommissioned in accordance with applicable NYSDEC tank closure requirements, including Division of Environmental Remediation (DER)-10 Section 5.5 and 6 NYCRR Part 613.9, and NYSDEC CP-51. USTs and/or associated appurtenances would be registered and administratively closed with the NYSDEC Petroleum Bulk Storage (PBS) unit. Closure documentation, such as Contractor affidavits, bills of lading for sludge disposal, and tank disposal receipts, would be provided as appendices in the Final Engineering Report (FER).

4.3.2 Documentation Sampling

One documented soil sample will be collected for every 900 sq ft of excavation base to document remedial performance in accordance with NYSDEC DER-10, or at an alternative frequency approved by NYSDEC. The excavation area is approximately 49,800 sq ft; therefore, at least 55 documentation samples will be collected. Documentation soil samples will be analyzed for the Part 375 list of VOCs, semi-volatile organic compounds (SVOCs), pesticides, metals, per- and polyfluoroalkyl substances (PFAS), and 1,4-dioxane. Samples will be collected into laboratory-provided bottle ware. VOCs will be collected into Terraore or Encore containers. Samples will be transported under chain of custody protocol to an Environmental Laboratory Accreditation Program (ELAP) certified laboratory.

Quality control procedures for confirmation soil sampling are included in the Quality Assurance Project Plan (QAPP; refer to Section 7). Confirmation analytical results will be provided in the NYSDEC's electronic data deliverable (EDD) format for EQUS™. The quality assurance/quality control (QA/QC) procedures required by the NYSDEC Analytical Services Protocol (ASP) and SW-846 methods will be followed. This will include instrument calibration, standard compound spikes, surrogate compound spikes, and analysis of quality control samples. The laboratory will provide sample bottles, which will be pre-cleaned and preserved. Where there are differences in the SW-846 and NYSDEC ASP requirements, the NYSDEC ASP will take precedence.

ASP Category B deliverables will be prepared for remedial performance samples collected during implementation of this Remedial Action Work Plan (RAWP). Data Usability Summary Reports (DUSRs) will be prepared by a qualified data validator and the findings will be reported in the FER.

4.3.3 Support of Excavation System

The excavation will be performed within steel sheet piles (NZ-14) installed to a minimum depth of El. -19.0. The sheets along the northern, western, and southern boundaries will be installed with rakers and walers; the sheet along the eastern boundary will not be for structural support during excavation, it is only installed as part of the LNAPL barrier wall. All of these sheet piles will remain in place following construction, though the rakers and walers will be removed. The sheet piles will have the interlocks sealed with appropriate sealant (e.g., Adeka®) to minimize leakage through the connections. Given that the Site development plan includes a partial basement on the eastern portion of the Site, temporary steel sheet piles (NZ-26) will be installed generally north-south with the internal part of the Site to a minimum depth of El. -32.0 for the construction of the basement foundation. The proposed building SOE plan, developed by JZN Engineering, is included in Appendix D.

4.3.4 Temporary Fabric Structure

Due to the nature of the source materials (e.g., phthalates), their potential odors, and the proximity of the excavation to adjacent buildings, the excavation will be performed below a temporary fabric structure. The temporary fabric structure would be placed over the work area to completely contain any odors generated from the remedial activities, including excavation, demolition, backfilling, stockpiling, soil amending, loading of impacted soil, and waste handling and transport. The temporary fabric structure will include an air handling system adequately sized to capture and/or treat the chemicals of concern generated inside the temporary fabric structure prior to discharge outside of the structure. The air handling system will provide at least four air changes per hour within the temporary structure, including the excavation volume, to allow the workers inside the fabric structure to maintain a PPE level of C or D. The exhaust system will treat the air such that the following performance standards are met in the exhaust air outside of the structure:

- Total particulate levels below 100 milligrams per cubic meter (mg/m^3);
- Total VOCs below 2.5 parts per million (ppm); and
- No detectable odors at the Site perimeter.

See the Odor and Vapor Control and Temporary Fabric Structures Specification 01 56 00 for more details on the system specifications (Attachment 1).

The temporary fabric structure will be installed after the installation of the sheet piles. The temporary fabric structure may not be large enough to cover the entire Site and may have to be moved to provide complete coverage. No intrusive activities of impacted materials with the potential to emit odors shall occur without engineering controls in place (e.g., within a structure).

4.3.5 Stockpile Methods

Stockpiles may be used to separate and stage excavated material pending loading onto trucks. Separate stockpile areas may be constructed to avoid comingling materials. Stockpile areas will all be created within the temporary fabric structure. No stockpiling of contaminated materials will be allowed outside of the temporary fabric structure. Clean imported fill may be stockpiled outside the temporary fabric structure and will meet the following minimum requirements:

- Clean fill will be placed onto a minimum thickness of 6 mil low-permeability liner of sufficient strength and thickness to prevent puncture during use.
- Efforts will be made to place and remove the soil to minimize the potential to jeopardize the integrity of the liner.
- Stockpiles will be covered at the designated times (see below) with minimum 6-mil plastic sheeting or tarps which will be securely anchored to the ground. Stockpiles will be routinely inspected, and broken sheeting covers will be promptly replaced.
- Each stockpile will be encircled with silt fences and hay bales, as needed, to contain and filter particulates from rainwater that has drained from the soils and to mitigate the potential for surface water runoff.

- Stockpiles will be inspected at a minimum of once daily and after every storm event.

4.3.6 Material Excavation and Load Out

Loaded vehicles leaving the Site will be appropriately lined, securely covered, manifested, and placarded in accordance with the appropriate federal, state, and local requirements, including applicable transportation requirements (i.e., New York State Department of Transportation [NYSDOT] and New York City Department of Transportation [NYCDOT] requirements). Trucks hauling historic fill material will not be lined unless free liquids are present or the material is grossly impacted. Trucks hauling hazardous material will be lined and covered. Hazardous wastes derived from the Site will be stored, transported, and disposed of in compliance with applicable local, state, and federal regulations.

A truck wash will be operated on Site. Trucks will be washed, as necessary, before leaving the Site, and Site ingress and egress points will be cleaned of dirt and other materials to prevent material generated during remediation and development from being tracked from the Site.

4.3.7 On-Site Soil Reuse

Material reuse is not anticipated at the Site. If Site material is proposed for reuse, material will be stockpiled and sampled at a frequency consistent with the recommendations of Table 5.4(e)10 in DER-10 to confirm Unrestricted Use Soil Cleanup Objectives (UUSCOs) are achieved prior to placing backfill. It is noted that only soils meeting the requirements in this section may be reused. Soil proposed for reuse must be non-hazardous, must not be grossly contaminated, and must meet Track 1 UUSCOs. Soil proposed for reuse will not contain organic matter, including wood, roots, stumps, etc., or other solid waste derived from clearing and grubbing. Soil removed during implementation of the remedy will not be reused in a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

4.3.8 Imported Backfill

Imported soil for backfill must meet the requirements of 6 NYCRR Part 375-6.7(d) and NYSDEC DER-10 Section 5.4(e), Table 5.4(e)10. Documentation of the material will be provided to NYSDEC for approval prior to its use on Site.

Backfill material will consist of clean fill (as described in the following paragraph) or other acceptable fill material such as virgin stone from a quarry or recycled concrete aggregate (RCA). If RCA is imported to the Site, it will be from a NYSDEC-registered facility in compliance with 6 NYCRR Part 360 registration and permitting requirements for the period of acquisition of RCA. RCA imported from compliant facilities will not require chemical testing, unless required by the NYSDEC under the terms for operation of the facility. RCA imported to the Site must be derived from recognizable and uncontaminated concrete, with no more than 10 percent by weight passing through a No. 80 sieve. RCA is not acceptable for and will not be used as cover or drainage material.

Imported soil will meet the UUSCOs. Non-compliant soils will not be imported to the Site. Clean fill will be segregated at a source/facility that is free of environmental contaminants. Qualified environmental personnel will collect representative samples at a frequency consistent with NYSDEC CP-51. The samples will be analyzed for Part 375 VOCs, SVOCs, pesticides/herbicides, polychlorinated biphenyls (PCBs),

cyanide, metals (including trivalent and hexavalent chromium), 1,4-dioxane, and PFAS by a NYSDOH ELAP-certified laboratory. Upon meeting these criteria, the certified-clean fill will be transported to the Site and segregated from impacted material, as necessary, on plastic sheeting until used as backfill. Trucks entering the Site with imported soils will be secured with tight-fitting covers.

A demarcation barrier will be placed at the bottom of the excavation prior to placing any backfill materials.

4.3.9 Dewatering

Groundwater at the Site is generally found within the fill or glacial deposits at depths noted in the Remedial Investigation (RI) Report at 7 to 12 feet bgs. The anticipated depth of excavation at the Site is 16 feet bgs. Therefore, during excavation and installation of the foundation, groundwater management may be required to facilitate construction. An on-site dewatering system will be used by the Contractor to collect the groundwater during the excavation. Groundwater will be collected from within the active work area using sumps or trenches as determined by the Contractor. Pumps will be used to convey collected groundwater from the collection point(s) to a temporary on-site holding system. The primary treatment will consist of a temporary holding tank (e.g., frac tank) for the settling of fines prior to offloading, transportation, and disposal.

The amount of groundwater to be handled during the excavation will be limited to initial dewatering of the area. The steel sheeting with interlocking sealant will effectively eliminate the horizontal seepage of water into the excavations. The continuous underlying confining layer will reduce the prevent the vertical seepage of groundwater into the excavation. The dewatering contractor and the design engineer will evaluate the terminal depth of the sheetpile wall and may adjust to deeper depth (presumably to advance to a confining layer) to limit the amount of vertical hydraulic seepage into the base of the excavation. Details of the design will be presented in the 60% design submittal.

Dewatered fluids will not be recharged back to the land surface or subsurface. Dewatering fluids will be managed off Site. Discharge of water generated during remedial construction to surface waters or storm sewers is prohibited without a NYSDEC-issued State Pollutant Discharge Elimination System (SPDES) permit and discharge to the New York City sewer system is prohibited without a New York City Department of Environmental Protection (NYCDEP)-issued permit.

4.4 LNAPL BARRIER SYSTEM

Separate physical barriers will be installed for the on-site (OU-1) and off-site (OU-2) remedy as discussed below and shown on Drawing C-302.

4.4.1 On-Site (OU-1) Barrier

As discussed in Section 4.3.3, steel sheet piles will be installed along the perimeter of the Site as part of the SOE system down to a minimum depth of El. -19. The LNAPL on OU-1 will most likely be fully removed from OU-1 during the excavation component; therefore, the sheet piles will remain in place following the restoration of OU-1 to prevent LNAPL migration from OU-2 back onto the remediated

OU-1 parcel. The upper portion of the sheet piles (e.g., top 5 feet) may be removed to allow for the installation of utilities at the Site.

4.4.2 Off-Site (OU-2) Barrier

The LNAPL plume has migrated to the south and west of OU-1, under both Franklin and Dupont Street. The LNAPL plume has not migrated to the parcel located at the southwest corner of Franklin Street and Dupont Steet (Block 2492, Lot 20, 257 Franklin Street). To prevent the migration of the LNAPL plume onto this parcel, a steel sheet pile cut-off wall will be installed consisting of NZ-14 sheet piles installed to a depth of 20 feet bgs. The cut-off wall will extend 75 feet to the west and 75 feet to the south from the northwest corner of the property boundary. The upper portion of the sheet piles (e.g., top 5 feet) may be removed to allow for the installation of utilities at the Site. These sheet piles shall be installed prior to the demolition of the concrete slab of the former NuHart building on OU-1.

4.5 COVER SYSTEM

Per the ROD, a Site cover system is required in areas of the Site where the upper two feet of exposed soil will exceed the Restricted Residential Soil Cleanup Objectives (RRSCOs), or if a soil cover is to be used, the soil cover must consist of a minimum of two feet of clean backfill placed over a demarcation layer, with the top six inches of fill material capable of maintaining a vegetative cover. Since the excavation depth extends to a minimum of 16 feet bgs and all backfill materials will meet the unrestricted use requirements of 6 NYCRR Part 375-6.7(d), the entire Site restoration consisting of foundations, concrete, pavement, sidewalk, and vegetation should be considered a cover. Samples collected at the base of the excavation, prior to backfilling, will document the effectiveness of the remedy. If all documentation samples meet the RRSCOs, then no soil cover will be required as an engineering control. If any of the documentation samples do not meet the RRSCOs, then the cover system will be considered an engineering control and will require monitoring as part of the Site Management Plan (SMP). Any disturbance of material below the demarcation layer will need to be done in accordance with the soil management plan included as part of the SMP.

4.6 LNAPL RECOVERY

A network of recovery wells will be installed in OU-2 to recover LNAPL from the subsurface that has migrated from the site. The recovery wells will be spaced approximately 30 feet apart with the sidewalk areas where LNAPL has been detected in the past as shown in Drawing C-400. The most recent round of LNAPL gauging at the site on March 8, 2022 indicated that eight off-site monitoring wells had measurable levels of LNAPL as summarized below.

Well ID	Diameter (in)	Depth To Water (ft)	Depth to LNAPL (ft)	LNAPL Thickness (ft)
MW-5	2	12.50	9.30	3.20
MW-6	2	10.35	8.70	1.65
MW-7	2	9.60	8.60	1.00
MW-15	2	10.40	5.97	4.43
MW-16	2	10.63	10.60	0.03

MW-20	2	12.03	10.01	2.02
MW-25	2	13.50	9.63	3.87
MW-26	2	12.70	9.68	3.02

Based on information provided in the FS, the LNAPL interval is approximately 2 feet thick at a depth of approximately 11 to 13 feet bgs. The LNAPL investigation also reported that the measured depth of the LNAPL in the wells was 1.5 to 2.0 feet higher than the LNAPL intervals as determined by soil boings and test pits, hence why the measurements on LNAPL as measured in March 2022 were generally between 8 and 11 feet bgs. Based on this, the recovery wells to be installed off-site will have 10-ft long well screens placed between 5 and 15 feet bgs. The wells will be constructed with 6-inch diameter casings with 0.01-inch slots well screens. The recovery wells will be installed within the sidewalk and completed with a flush mounted, bolted vault.

LNAPL monitoring will begin as soon as the wells have been installed and developed and will be performed at least monthly during remediation construction occurs on-site. If wells have more than 6-inches of measurable LNAPL, the LNAPL will be recovered from the well. Recovery will initially be done manually unless the recovery effort demands the use of a mechanized system such as a vacuum truck.

Additional information on long-term LNAPL monitoring and recovery will be provided in the SMP for the site.

4.7 VOC GROUNDWATER TREATMENT

The remedy selected in the ROD included implementation of AS/SVE to address the groundwater plume contaminated by VOCs in the northeastern portion of OU-1. The overburden groundwater at the Site exists in the sand/silt unit above a confining clay unit. Based on borings installed during the RI, the depth of the sand/silt unit in within the VOC impact area was 13 to 21 feet bgs. The air sparge wells in the Feasibility Study (FS) had proposed injection screen intervals of 18 to 20 feet bgs. The excavation element in the ROD assumed an excavation depth of approximately 10 feet, or about the depth of the water table. The air sparging component would therefore treat impacted groundwater from 10 to 20 feet. Under the current redevelopment alternative, the soil will be excavated to a depth of 16 feet with the concrete flooring of the underlying garage having a depth of approximately 12 feet below grade. Subsequently, the use of air sparging to treat the dissolved phase VOC plume in this area should not be performed since most of the impacted groundwater and soils associated with the VOC plume will be removed as part of the excavation remedy. In addition, the injection of air through the sparge wells and subsequent capture in extraction wells is not feasible given the limited saturated zone (approximately 4 feet or 16 to 20 feet bgs) and unsaturated materials beneath the garage floor in which to capture the off-gas. To treat the VOC groundwater plume, the use of zero valent iron (ZVI) is proposed in place of the soil vapor extraction/air sparging technology. ZVI will be applied in situ to chemically reduce the chlorinated VOCs (i.e., TCE) based on the following stoichiometry:



ZVI will be applied through direct mixing with the soil (e.g., bucket mixing) for the on-site soils that have already been excavated down to a depth of 16 feet bgs and through injection into the saturated soils (e.g., direct push points) for the off-site soils under the sidewalk and pavement on Clay Street.

The estimated area requiring treatment for the on-site soils is approximately 14,000 square feet. The treatment depth will be from 16 to 20 feet bgs, or a 4-ft treatment zone. The volume of soil to be treated is therefore 56,000 cubic feet. A ratio of 0.5% granular ZVI to soil mass is proposed. Assuming a soil density of 120 pounds per cubic feet, the amount of ZVI to be mixed with the soil is 0.60 pounds per cubic foot of soil, or approximately 33,600 pounds of ZVI. The ZVI particle size proposed for injection is in the range of 25-50 microns in diameter.

The estimated area requiring treatment for the off-site area is approximately 6,200 square feet. The treatment depth will be from 10 feet bgs (i.e., the water table surface) to 20 feet bgs, or a 10-ft treatment zone. The volume of soil to be treated is 62,000 cubic feet. The injections will be conducted via direct push injections. Assuming an estimated radius of influence of 10 feet, approximately 7 injection points will be required to treat the off-site VOC groundwater plume. The amount of ZVI to be injected is 6,000 pounds based on a 10 g/L targeted concentration in the treated groundwater zone. The ZVI particle size proposed for injection is in the range of 25 microns in diameter.

Four monitoring wells will be installed in the parking garage area to monitor groundwater quality following remediation. These wells will be installed with screened intervals from 18 to 23 feet below grade, or 2 to 7 feet below the bottom of excavation. Details related to post-remediation groundwater monitoring will be provided in the SMP.

4.8 SUB-SLAB DEPRESSURIZATION SYSTEM

A SSDS, or other acceptable measure, is required to mitigate the migration of vapors into any on-site building from soil or groundwater. The foundation elements to be constructed on-site over potentially impacted soil or groundwater will consist of an at-grade foundation for the building on the western part of the Site and a foundation for a sunken garage structure on the eastern part of the Site. Passive SSDSs will be installed as part of the at-grade foundation and for the sunken garage foundation. The SSDSs will include 3-inch horizontal perforated pipe installed within a gravel sub-base and a 20-mil vapor-proof membrane installed between the gravel sub-base and concrete slab. All perforations through the vapor barrier will be sealed. The horizontal perforated pipe will be connected to 3-inch solid polyvinyl chloride (PVC) vent pipe. The vent pipe will not be installed in or below any occupied area of the building. The vent pipe will terminate at least 12 inches above the roof and 10 feet away from any adjacent buildings or heating, ventilation, and air conditioning (HVAC) intakes. Vapor monitoring points will be installed in both the at-grade foundation and sunken garage foundation. The vapor monitoring point assembly will be installed in a sealed 2-inch penetration in the concrete floor. The vapor monitoring point assembly will consist of a ¼-inch-diameter, 3-inch-long stainless-steel mesh screen installed within the sub-slab gravel. The stainless-steel screen will be connected to a ¼-inch stainless-steel tube with a ¼-inch compression fitting/connect installed at the top. The top will be sealed with a 2-inch flush-mounted locking cap. The soil vapor monitoring point assembly will fit within the 2-inch penetration with grout, or equivalent system, to seal the sub-slab from the above slab.

Details related to the SSDS operation and monitoring will be provided in the SMP.

4.9 WASTE MANAGEMENT

Several potential waste streams have been identified that may be generated during the remedial actions:

1. Non-hazardous, LNAPL-impacted soil;
2. Non-hazardous, LNAPL-impacted soil containing PCBs;
3. Characteristic hazardous waste material;
4. List hazardous waste material;
5. Non-hazardous, general fill excavated during the remedial excavation activities;
6. USTs (filled with PloyMaster R-501 foam) and associated appurtenances;
7. Construction debris;
8. Extracted groundwater; and
9. Incidental project wastes such as PPE.

4.9.1 On-Site Waste Management

Remediation equipment will require decontamination at certain points in the project. In addition, debris generated during excavation may require decontamination to meet disposal facility acceptance requirements. Decontamination will take place using brushes, steam cleaners, and/or pressure washers. Residues from decontamination operations will be collected and managed with other contaminated soil. Decontamination water will be collected for off-site disposal or treatment. Groundwater seeping into the excavation areas will be captured, stored on Site, and sent for off-site treatment/disposal. All waste management activities, including handling and loading, will be performed in such a manner that odors and vapors are controlled in accordance with the Community Air Monitoring Plan (CAMP) provided in Appendix E.

4.9.2 Pre-Remediation Waste Characterization

Waste characterization of the proposed excavated soil was performed in February 2022. The proposed sampling frequency was based on one sample per 500 cu yd. The Site was divided into 21 horizontal grids of approximately 2,400 square feet. Each grid was then divided into three intervals: 0 to 6 feet, 6 to 11 feet, and 11 to 16 feet (the bottom of the remediation excavation). Therefore, a total of 63 samples were collected to represent approximately 500 cu yd.

In each cell, one discrete and one 10-point composite sample were collected. The composite sample was created by homogenizing two discrete samples at random selected depths intervals in each proposed boring. The discrete sample was collected from the soils that yield the highest photoionization detector (PID) reading and/or signs of visual and olfactory contaminant. Samples were containerized into laboratory-provided bottleware (5-gram Terracore specifically for total VOCs), placed on ice in coolers maintained at 4 degrees Celsius (°C) degrees, and shipped by courier to a NYSDOH ELAP-certified laboratory for the analysis of the target disposal facility's analytes list.

4.9.3 Off-site Transportation

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. Trucks headed to disposal facilities will travel northeast on Box Street, north on the Pulaski Bridge, northeast on Jackson Avenue, south on McGuinness Boulevard, southwest on Meeker Avenue, south on Graham Avenue, northeast on Meeker Avenue, northeast on the Brooklyn Queens Expressway, west on the Grand Central Parkway, northwest on the Robert F. Kennedy Bridge, west and northwest on the Major Deegan Expressway and west on I-95 across the George Washington Bridge. Truck routes are shown on Drawing C-201.

Loaded trucks will exit in the vicinity of the Site using approved truck routes. These routes are the most appropriate route to and from the Site and take into account the following:

Limiting transport through residential areas and past sensitive sites:

- Use of city mapped truck routes;
- Prohibiting off-site queuing of trucks entering the facility;
- Limiting total distance to major highways;
- Promoting safety in access to highways;
- Overall safety in transport; and
- Community input (where necessary).

Trucks will be prohibited from excessive stopping and idling in the neighborhood outside the Site. Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, or hazardous lead-impacted material, truck liners will be used.

4.9.4 Off-site Treatment/Disposal

All excavated materials sent off Site will be treated/disposed at an appropriate and approved disposal facility. Facilities are currently being evaluated and will be finalized pending completion of waste characterization sampling. Proposed disposal facilities will be presented in the 60% design submittal.

4.9.5 Water Management

Liquids removed from the Site, including dewatering fluids, will be handled, transported, and disposed in accordance with applicable local, state, and federal regulations. Prior to mobilization, analytical data will be distributed to facilities capable of handling, treating, and/or disposing of groundwater representative of the Site. If supplemental data is needed, a representative groundwater sample will be collected from an existing on-site well.

4.10 SITE RESTORATION

The Site will be restored after excavation is complete with an approved backfill material and composite cover as discussed in Section 4.5. Additional details of the cover system will be presented in the 60% design submittal.

4.11 ENVIRONMENTAL MONITORING AND CONTROLS

The Contractor will provide environmental controls to ensure that the work activities do not spread impacted soil and wastes outside the impacted areas and maintain the protection of human health and the environment throughout the project.

4.11.1 Odor, Vapor, Dust, and Noise Control

A variety of engineering controls will be available to control odors, vapors, and dust associated with excavation activities, including but not limited to usage of foam and odor/dust suppressant sprays. Those controls will include, but will not necessarily be limited to wetting soils with water to control dust, limiting the size of excavations, covering contaminated soils with plastic sheeting or foam, spraying soils with Biosolve™, and placing a temporary structure with an air handling system with off-gas controls over the excavation areas. The Contractor will provide detailed descriptions and drawings with the means and methods proposed for controlling and monitoring odors and vapors during the work. All odor and vapor control equipment and materials will be approved by the Engineer prior to use.

Equipment or material substitutions for odor and vapor control will be evaluated by the Engineer prior to use on-site on a case-by-case basis. Alternative means and methods of controlling odors and vapors will not be used until approved by the Engineer in writing.

Air monitoring will be performed in accordance with the CAMP (Appendix E). The work will be stopped in a controlled stand-down procedure, if acceptable levels of air impacts are exceeded. The work stoppage will continue until the source of the emissions is found and the appropriate mitigation efforts are in place. Engineering controls will be applied as needed based upon Site conditions and the results of air monitoring activities.

Care will also be exercised to mitigate noise impacts during the project activities. Work hours will be limited to routine daytime hours and equipment will be maintained in proper working order. Where necessary, shrouding and/or sound dampening measures will be utilized to minimize noise. All City ordinances and requirements regarding noise will be followed.

4.11.2 Air Monitoring

Site perimeter and work zone air monitoring will be performed per NYSDOH and Occupational Safety and Health Administration or Act (OSHA) requirements, and according to the Engineer's HASP and CAMP and the Contractor's HASP. The contaminants of concern are VOCs and particulates. The CAMP is located in Appendix E.

Summaries of all air monitoring data will be provided to the appropriate parties (e.g., NYSDEC and NYSDOH) on a weekly basis to facilitate the transfer of information related to potential health risks.

4.11.3 Erosion and Sediment Control

Erosion will be prevented and sediment will be controlled during all on-site earthwork activities in accordance with the applicable New York State guidance. Stormwater run-off will be controlled in a manner to prevent contact with impacted soils. Any stormwater that does contact impacted soils will be managed in accordance with Section 4.6.5. Hay bales, silt fence, stone, and/or riprap will be used as necessary to prevent erosion of exposed soils. All erosion controls will be inspected a minimum of once per week and after significant rainfall events (greater than ½ inch per day). Additional erosion control materials will be kept on Site to immediately repair any deficiencies that are discovered during the inspections. Since the actively disturbed area exceeds one acre, a Storm Water Pollution Prevention Plan will be reviewed by the Engineer and submitted prior to beginning intrusive work on Site.

5. Documentation of Site Activities

5.1 DAILY FIELD CONSTRUCTION REPORT

A Daily Field Report (DFR), including daily community air monitoring data, will be prepared to document daily Site activities. The DFR will be submitted the following business day in electronic format to NYSDEC and NYSDOH.

5.2 MONTHLY PROGRESS REPORTS

A monthly progress report, documenting milestones of the project, will be submitted to NYSDEC and NYSDOH prior to the 10th calendar day of each month for the duration of remedy implementation.

5.3 MASTER SAMPLE LOG

A on-Site log will remain in the field office to record every sample collected during implementation of the remedy. The sampling technician will log in all samples collected and those sent to the off-site analytical laboratory.

5.4 CHAIN OF CUSTODY

A chain of custody form will document custody of all samples from the field to the laboratory.

6. Permitting and Regulatory Requirements

6.1 PERMITTING

The appropriate permits shall be obtained by the remediation Contractor prior to initiation of any work at the Site, and the substantive requirements of these permits shall be met during all project activities. A list of permits will be included in the 60% design submittal.

6.2 REGULATORY REQUIREMENTS

Environmental regulations regarding hazardous and non-hazardous waste management apply to this work and will be implemented accordingly. These include provisions for the containment and cleanup of spills and other standard provisions that will be included in the Specifications.

Regulations promulgated by OSHA specify safety and health requirements for work procedures at all workplaces and specifically at construction sites and hazardous waste sites. Industry standards for work at hazardous waste sites presented in 29 CFR 1910.120 describe specific requirements, including the following:

- Preparation of a project HASP;
- Training and medical monitoring of personnel who may be exposed to hazardous substances; and
- Air monitoring, respiratory protection, and PPE.

A Site safety coordinator will be established by the Contractor prior to implementation of the remedy who will implement procedures outlined in the HASP (Appendix F) including daily health and safety review meetings, proper use of safety equipment, proper mechanical equipment use, and other policies. At a minimum, the PPE to be worn on Site will include safety glasses, a hard hat, hearing protection, and steel-toed shoes or boots.

The Contractor shall prepare a Site HASP, which will be subject to the Engineer's review. The Contractor shall follow the requirements of their own HASP throughout the work. Prior to the work, the selected Contractor will provide to the Site safety coordinator written evidence of the following items for each person who will be entering the work zone:

- Date of respirator fit test (where and when required);
- Date of OSHA 40-hour training (or 8-hour refresher training); and
- Date of annual physical.

Persons without these items, both up-to-date and on file with the Site safety coordinator, will not be allowed to enter the work zone.

6.3 TRANSPORTATION REQUIREMENTS

The U.S. Department of Transportation (DOT) has developed requirements which regulate the transportation of hazardous materials by road and rail. Among the hazardous materials identified in these regulations are coal tar distillates. In addition, as discussed above, hazardous waste regulations specify that shipments of hazardous wastes must meet certain requirements presented in applicable federal and state regulations.

Specific requirements for hazardous material shipments include the following:

- All truckers must have valid 364 Waste Transporter Permits;
- Shipping papers must include a description of hazardous materials included in the shipment along with the DOT-designated identification number and hazard class. Hazardous wastes may not be shipped without a manifest (49 CFR 172.200);
- Each container, package, or vehicle containing a hazardous material must be marked or labeled with the DOT shipping name, technical name, identification number, and hazard class (49 CFR 172.300 and .400);
- Each vehicle or container containing a hazardous material must be appropriately placarded (49 CFR 172.500);
- When hazardous materials are transported, emergency response information must be available at the point of loading, unloading, and during transport; and
- Truck routes to and from the Site will comply with the Transportation Plan that will be developed as part of the Remedial Design (to be included in the 60% design submittal).

7. Quality Assurance

Quality assurance procedures will be implemented during the work to ensure that it is in conformance with the Remedial Design, and to provide the basis for implementation of contingency actions, if necessary, to bring the work into conformance with the Remedial Design (Appendix G). Please refer to the procedures noted below and those located in the Construction Quality Assurance Plan (Appendix H) and the Quality Assurance Project Plan (Appendix I).

7.1 GENERAL QUALITY ASSURANCE PROCEDURES

The following quality assurance procedures and tests will be implemented:

- Surveying of the work limits as described in Section 4.3.4;
- Submittal by the Contractor of weigh tickets for all earthen materials transported to or from the Site;
- Submittal by the Contractor, prior to the work, of sieve analyses for all imported earthen materials;
- Evaluation of the Contractor's proposed borrow source(s) for imported earthen materials. The Contractor will provide analytical data indicating that imported material meets the requirements specified in Section 4.4.3; and
- Field verification by the Engineer of excavation, and placed material depths, areas, and volumes; and
- Applicable quality assurance and quality control sampling and analytical requirements as outlined in the Quality Assurance Project Plan.

8. Project Reporting

8.1 PROGRESS REPORTS

During the course of the work, the Contractor will regularly provide to the Engineer:

- Daily field logs;
- Equipment and material testing records; and
- Weigh tickets.

During the course of the work, weekly progress meetings will be conducted with attendance by NYSDEC and NYSDOH, if needed.

The Engineer will provide monthly progress reports to NYSDEC and NYSDOH. Progress reports will include:

- The previous month's actions;
- Next month's planned actions;
- Sampling and analytical results;
- Design changes and other modifications to the design; and
- Revised project schedules.

8.2 FINAL ENGINEERING REPORT

Within 90 days of completion of the remedial activities discussed in this Remedial Design Report, the Engineer will prepare a FER. The following items will be included in the FER:

- A description of all field work performed;
- As-built or record drawings;
- Identification of all changes to the Remedial Design;
- Copies of all pertinent analytical results, testing records, weigh tickets, bills of lading, and manifests from the disposal of materials; and
- Engineer's certification.

8.2.1 RCRA Closure Report

An addendum to the forthcoming RCRA Closure Report, which will address aboveground components identified in the RCRA Closure Plan approved by NYSDEC on 4 January 2022, will identify the underground structures to be addressed for RCRA closure (i.e. underground tank piping not addressed during historic closed-in-place tank work). The RCRA Closure Report including the addendum will be included as an Attachment to the FER.

8.3 SITE MANAGEMENT PLAN

Within 90 days of completion of the remedial activities discussed in this Remedial Design Report, a draft SMP for the remaining on-site (OU-1) contamination will be submitted to the NYSDEC for review. The purpose of the Site management is to ensure the safe reuse of the property where contamination remains in place. The SMP will provide discussions on institutional controls (ICs) and engineering controls (ECs) required to properly manage the residual contamination and will include the following:

- A description of all remedial actions performed, including all contaminated materials removed from the Site;
- On-site treatment system (e.g., groundwater treatment remedy);
- Residual Contamination;
- List of ICs (e.g., environmental easement) and ECs (e.g., cover system, if applicable; groundwater treatment remedy; SSDS);
- IC/EC Control Plan, including a soil management plan, if applicable;
- Monitoring Plan (e.g., LNAPL/water level monitoring; groundwater sampling; cover system inspection, if applicable)
- Operations and Maintenance Plan (e.g., LNAPL recovery);
- Site Management Reporting Plan; and
- Engineer's certification.

9. Green Remediation

The work completed as part of this work plan will comply with all NYSDEC guidance documents including DER-31: Green Remediation (NYSDEC, 2011). To ensure compliance with DER-31, the work will be completed using the best practices and techniques described below. In addition to the items discussed in Section 8.0 – Project Reporting, specific reporting methods relative to DER-31 are further described below.

9.1 BEST PRACTICES AND TECHNIQUES

DER-31 provides some examples of best practices and techniques that could be applied during all phases of remediation (Attachment 1 of the DER-31 policy). In addition, NYSDEC expects that the techniques identified below will be implemented at sites unless a site-specific evaluation demonstrates impracticability or favors an alternative green approach:

Practice/Technique	Potential Benefits ¹	Applicable to this Work Plan
Use renewable energy where possible or purchase Renewable Energy Credits (RECs)	Reduce/supplement purchased energy use	
Use of remediation technologies with an intermittent energy supply (i.e., energy use during peak energy generation only)	Reduce energy use	
Incorporate green building design	Reduce future use impacts	
Reuse existing buildings and infrastructure to reduce waste	Reduce waste and material use	
Reuse and recycle construction and demolition debris and other materials (i.e., grind waste wood and other organics for on-site use)	Reduce waste and material use	
Design cover systems to be usable (i.e., habitat or recreation)	Reduce construction impacts of future development	X
Reduce vehicle idling	Reduce air emissions and fuel use	X
Use of Low-Sulfur Diesel Fuel (LSDF) or alternate fuels (i.e., biodiesel or E85) when possible	Reduce air emissions	X
Sequence work to minimize double-handling of materials	Reduce construction impacts	X
Use energy efficient systems and office equipment in the job trailer	Reduce energy use	X
¹ Potential benefits listed are not all inclusive and will vary dependent upon the site and implementation of the practice or technique.		

In order to comply with the requirements of DER-31 the following actions will be taken:

1. All vehicles and fuel consuming equipment on Site will be shut off if not in use for more than 5 minutes;
2. If necessary, any soil cover placed on Site will meet NYCRR Part 375 residential use soil standards and will allow future use of the Site in a residential setting;
3. Work will be sequenced, to the extent practicable, to allow the direct loading of waste containers for off-site disposal;
4. To the extent practicable, energy efficient systems and office equipment will be utilized within the Site trailers;
5. All vehicles and equipment that consume diesel fuel will be required to use ultra-low sulfur diesel fuel.

9.2 REPORTING

All green and sustainable practices and techniques employed each day will be discussed within the daily reports described in the FER.

10. Schedule and Hours of Operation

The remedial activities are planned to begin in October 2022 and will last approximately 12 months. A schedule showing representative remedial activities and sequencing is provided in Appendix J.

Hours permitted for equipment operation during the remedial activities will be daylight hours between 7:00 a.m. and 5:00 p.m., Monday through Friday. The Contractor may be on Site earlier or later than actual hours of equipment operation, for the purpose of holding safety meetings and other daily planning associated with the Site work.

References

1. NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values, Division of Water Technical and Operational Guidance Series (TOGS 1.1.1), October, and addenda added: January 1999, April 2000, and June 2004.
2. NYSDEC, 2009. CP-43: Groundwater Monitoring Well Decommissioning Policy, 3 November.
3. NYSDEC, 2010. DER-10 Technical Guidance for Site Investigation and Remediation, 3 May.
4. NYSDEC, 2011. DER-31/Green Remediation. 20 January.
5. NYSDEC, 2019. Record of Decision, Former NuHart Plastic Manufacturing State Superfund Project, Site No. 224136, Brooklyn, New York, March.

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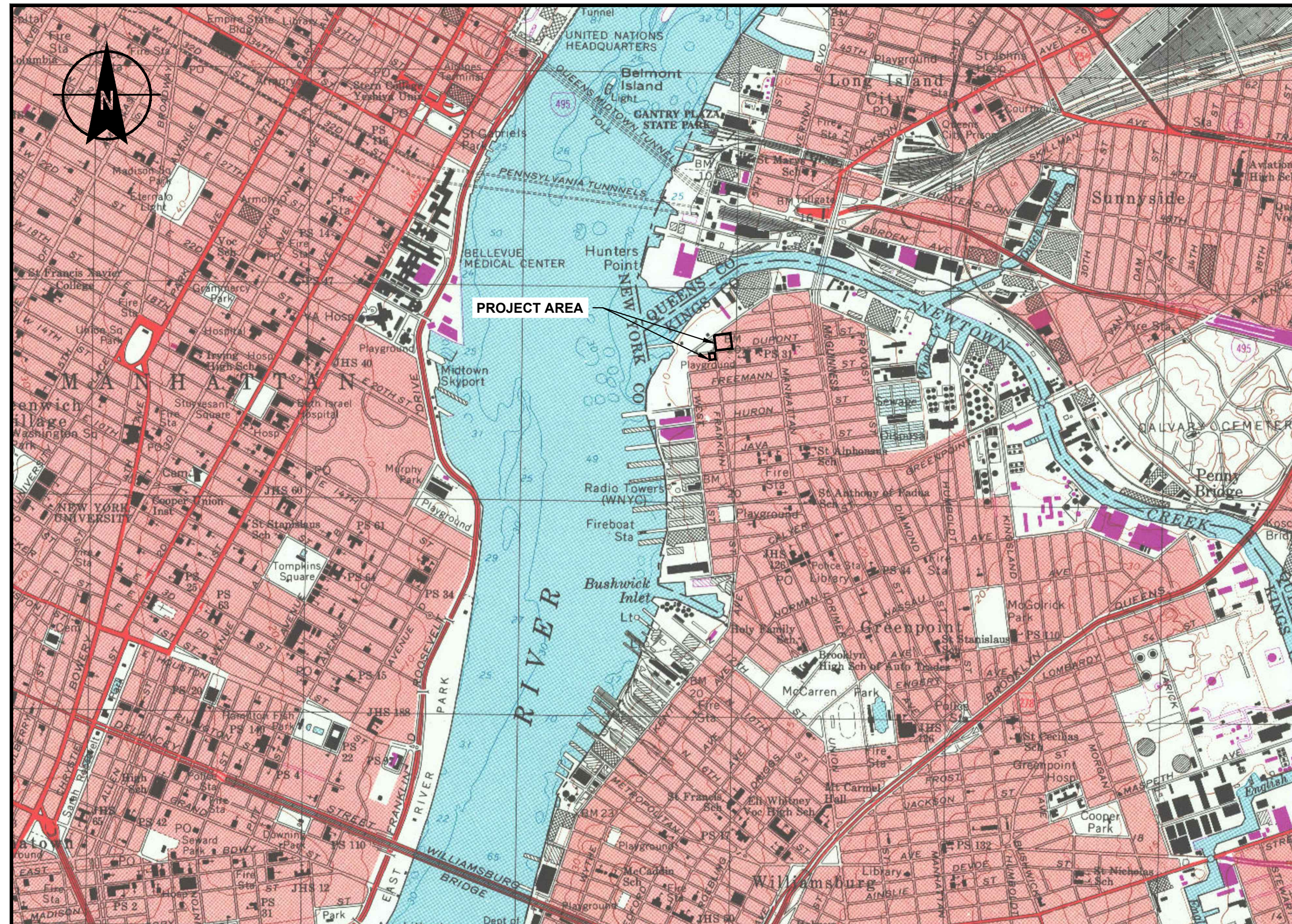
DESIGN DRAWINGS

30% REMEDIAL DESIGN

FORMER NUHART PLASTIC MANUFACTURING

BROOKLYN, KINGS COUNTY, NEW YORK

SITE NO. 224136



SITE LOCUS
TOPO SOURCE: USGS TOPOGRAPHIC MAP, BROOKLYN, NY
BROOKLYN QUADRANGLE (1995).

0 1500 3000
SCALE IN FEET



SITE AERIAL
MAP SOURCE: IMAGE DATED, MARCH 2021 TAKEN
ELECTRONICALLY FROM GOOGLE EARTH PRO.

0 80 160
SCALE IN FEET

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SHEET NO.	DRAWING NO.	SHEET TITLE
1	G-100	COVER SHEET
2	C-100	EXISTING CONDITIONS
3	C-200	REMEDY COMPONENTS
4	C-201	SITE PREPARATION PLAN
5	C-202	DEMOLITION PLAN
6	C-300	EXCAVATION PLAN
7	C-301	WASTE CHARACTERIZATION PLAN
8	C-302	LNAPL BARRIER/ LNAPL RECOVERY PLAN
9	C-303	VOC GROUNDWATER TREATMENT PLAN
10	C-304	SUB-SLAB DEPRESSURIZATION SYSTEM PLAN
11	C-400	SITE RESTORATION
12	C-500	DETAILS SHEET

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COVER SHEET

G-100

Sheet: 1 of 12

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LEGEND

- CONSTRUCTION PERMIT BOUNDARY
- IHWDS BOUNDARY
- EXTENT OF LNAPL IN GROUNDWATER
- EXTENT OF TCE CONTAMINATION ($\geq 100 \mu\text{g/L}$)
- MW-1 EXISTING GROUNDWATER MONITORING WELL
- RW-1 EXISTING PRODUCT RECOVERY WELL

NOTES

1. LOCATIONS OF EXISTING MONITORING WELLS, PRODUCT RECOVERY WELLS, IHWDS BOUNDARY, EXTENT OF LNAPL IN GROUNDWATER, AND EXTENT OF TCE CONTAMINATION ARE APPROXIMATE AND REFERENCED FROM ALTERNATIVE WELL LAYOUT FIGURES PREPARED BY GZA GEOENVIRONMENTAL, INC. DATED AUGUST 2016.
2. EXISTING UNDERGROUND UTILITIES ARE NOT SHOWN AND HAVE NOT BEEN SURVEYED AS PART OF THE REMEDIAL DESIGN.
3. LOCATION OF ALL EXISTING FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE.
4. AT THE TIME OF REMEDIATION, ALL OF THE ABOVE GRADE STRUCTURES WILL HAVE BEEN REMOVED AND ONLY THE EXISTING SLAB ON GRADE WILL REMAIN.

ABBREVIATIONS

- APPROX. = APPROXIMATELY
- BGS = BELOW GROUND SURFACE
- EL. = ELEVATION
- FT = FEET
- IHWDS = INACTIVE HAZARDOUS WASTE DISPOSAL SITE
- LNAPL = LIGHT NON-AQUEOUS PHASE LIQUID
- TCE = TRICHLOROETHYLENE
- VOC = VOLATILE ORGANIC COMPOUNDS
- ZVI = ZEROVALENT IRON



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EXISTING
CONDITIONS

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LEGEND

- IHWDS BOUNDARY
- EXTENT OF LNAPL IN GROUNDWATER
- EXTENT OF TCE IN GROUNDWATER ($\geq 100 \mu\text{g/L}$)
- PROPOSED LNAPL BARRIER SHEET PILE
- LIMIT OF EXCAVATION AREA
- PROPOSED BUILDING FOOTPRINT
- EXTENT OF SUB-SLAB DEPRESSURIZATION SYSTEM
- EXTENT OF UNDERGROUND PARKING GARAGE
- PROPOSED LNAPL RECOVERY AREAS
- PROPOSED VOC GROUNDWATER TREATMENT AREA

- NOTES**
1. LOCATION OF ALL EXISTING AND PROPOSED FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE.
 2. ANY BUILDINGS CONSTRUCTED AT THE SITE AND POTENTIALLY IMPACTED BY CONTAMINATED VAPORS MIGRATING FROM THE SITE WILL BE REQUIRED TO HAVE A SUB-SLAB DEPRESSURIZATION SYSTEM, OR OTHER ACCEPTABLE MEASURE, TO MITIGATE VAPORS INTO THE BUILDING FROM IMPACTED SUBSURFACE SOILS OR GROUNDWATER.

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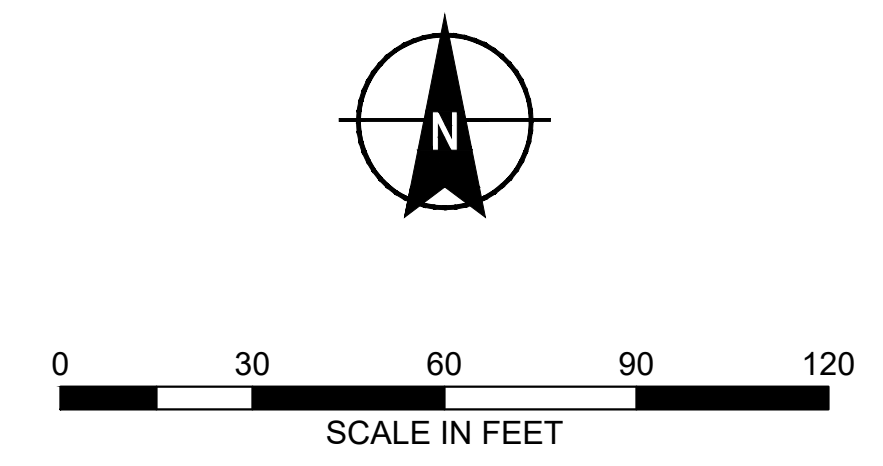
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REMEDY COMPONENTS

C-200

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- LEGEND**
- LIMIT OF WORK / LIMIT OF EXCAVATION
 - TEMPORARY CONSTRUCTION FENCING
 - CONSTRUCTION VEHICLE TRAFFIC FLOW

- NOTES**
1. LOCATION OF ALL EXISTING AND PROPOSED FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE.
 2. THE SIZE AND PLACEMENT OF THE TEMPORARY FABRIC STRUCTURE AND AIR HANDLING UNIT SHOWN FOR DISPLAY PURPOSES ONLY. SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR SUBMITTING A PLAN TO THE ENGINEER FOR APPROVAL WITH THE SIZE OF THE TEMPORARY FABRIC STRUCTURES AND THE NUMBER OF MOVES, IF ANY, REQUIRED TO ENSURE ALL INTRUSIVE WORK ASSOCIATED WITH THE REMEDIATION IS DONE WITHIN THE TEMPORARY FABRIC STRUCTURE.

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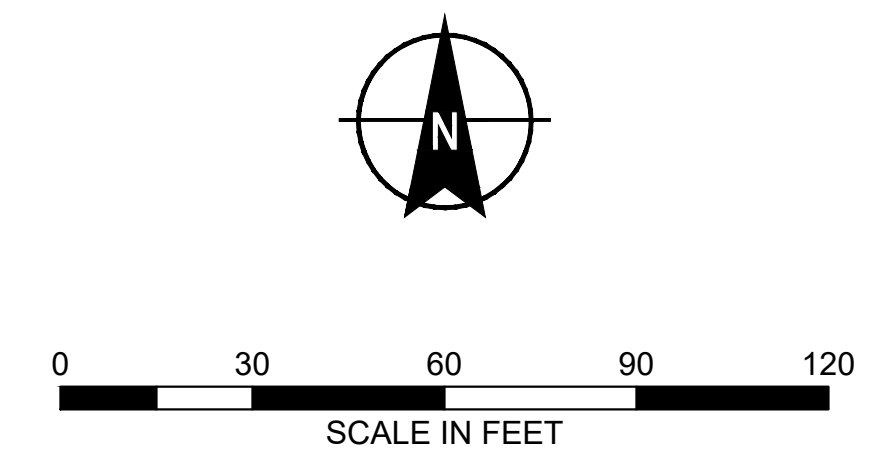
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SITE PREPARATION PLAN

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- LEGEND**
- LIMITS OF WORK
 - EXISTING UNDERGROUND STORAGE TANK (UST)
 - SITE FEATURE TO BE REMOVED
 - [Red Hatched Box] LIMIT EXISTING BUILDING SLAB TO BE REMOVED
 - [Red Dotted Box] LIMIT SIDEWALK CLEARING
 - MW-1 [Symbol] EXISTING GROUNDWATER MONITORING WELL TO BE PROTECTED DURING CONSTRUCTION
 - RW-1 [Symbol] EXISTING PRODUCT RECOVERY WELL TO BE PROTECTED DURING CONSTRUCTION
 - MW-1 [Red X Symbol] GROUNDWATER MONITORING WELL TO BE REMOVED
 - RW-1 [Red X Symbol] PRODUCT RECOVERY WELL TO BE REMOVED

- NOTES**
1. LOCATION OF ALL EXISTING AND PROPOSED FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE.
 2. VERIFY ALL EXISTING UTILITIES ON SITE HAVE BEEN REMOVED PRIOR TO DEMOLITION ACTIVITIES.
 3. DEMOLITION AND REMOVAL OF EXISTING BUILDING AND ALL OTHER STRUCTURES ABOVE SLAB GRADE TO BE COMPLETED BY OTHERS.

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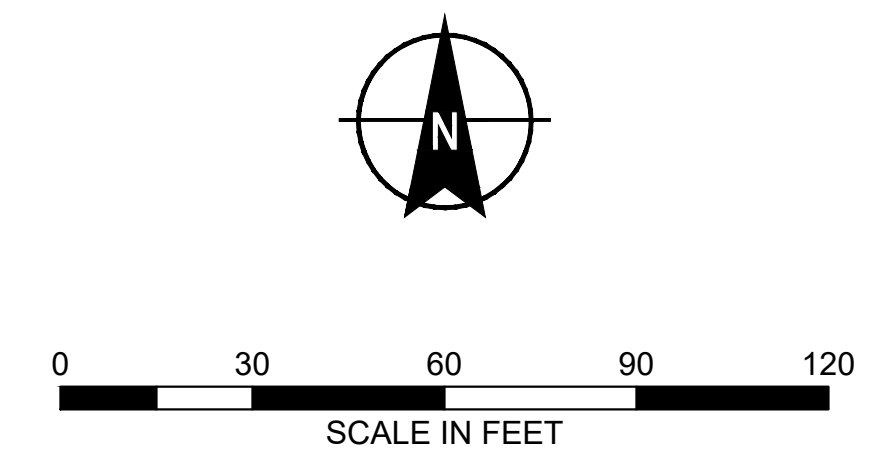
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DEMOLITION PLAN

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LEGEND

- EXTENT OF LNAPL IN GROUNDWATER
- EXTENT OF TCE IN GROUNDWATER ($\geq 100 \mu\text{g/L}$)
- - - SUPPORT OF EXCAVATION SHEETPILES
- LIMIT OF EXCAVATION AREA
- TK-16 ABANDONED IN-PLACE UNDERGROUND STORAGE TANK

NOTES

1. LOCATION OF ALL EXISTING AND PROPOSED FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE.
2. ALL EXCAVATION SHALL BE DONE WITHIN A TEMPORARY FABRIC STRUCTURE. PLACEMENT OF TEMPORARY FABRIC STRUCTURE TO CORRESPOND WITH EXCAVATION AND BACKFILLING SHALL BE DEVELOPED BY REMEDIAL CONTRACTOR.
3. UPON REACHING REMEDIATION EXCAVATION DEPTH OF 16 FEET AND PRIOR TO BACKFILLING, DOCUMENTATION SAMPLES SHALL BE COLLECTED AT A FREQUENCY OF 1 PER 900 SQUARE FEET.
4. ALL SHEETING TO REMAIN FOLLOWING EXCAVATION AND BACKFILLING.
5. BACKFILL MATERIAL SHALL MEET THE PHYSICAL REQUIREMENTS PROVIDED BY THE GEOTECHNICAL ENGINEER. BACKFILL MATERIAL SHALL MEET THE CHEMICAL REQUIREMENTS OF 6 NYCRR PART 375-6.7(d) AND NYSDEC DER-10 SECTION 5.4(e).
6. LOCATIONS OF CLOSED-IN PLACE UNDERGROUND STORAGE TANKS APPROXIMATE AND TAKEN FROM SPILL#0601852 UNDERGROUND STORAGE TANK CLOSURE REPORT, ADVANCED SITE RESTORATION, JULY 2006. TANKS CLOSED IN PLACE AND FILLED WITH POLYMASTER R 501. TANK VOLUMES SHOWN IN TABLE BELOW.

ESTIMATED EXCAVATION QUANTITIES		
AREA (SF)	DEPTH OF EXCAVATION (FT)	SPOILS VOLUME (CY)
49,914	16	29,600

UST VOLUME SUMMARY	
TANK #	SIZE (GALLONS)
6	6,000
7	6,000
8	10,000
9	10,000
10	5,000
11	5,000
12	5,000
13	5,000
14	10,000
15	6,000
16	6,000
17	1,500

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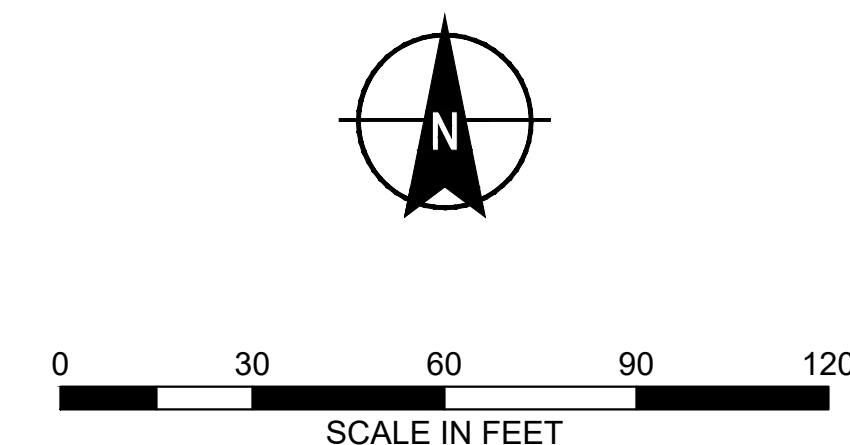
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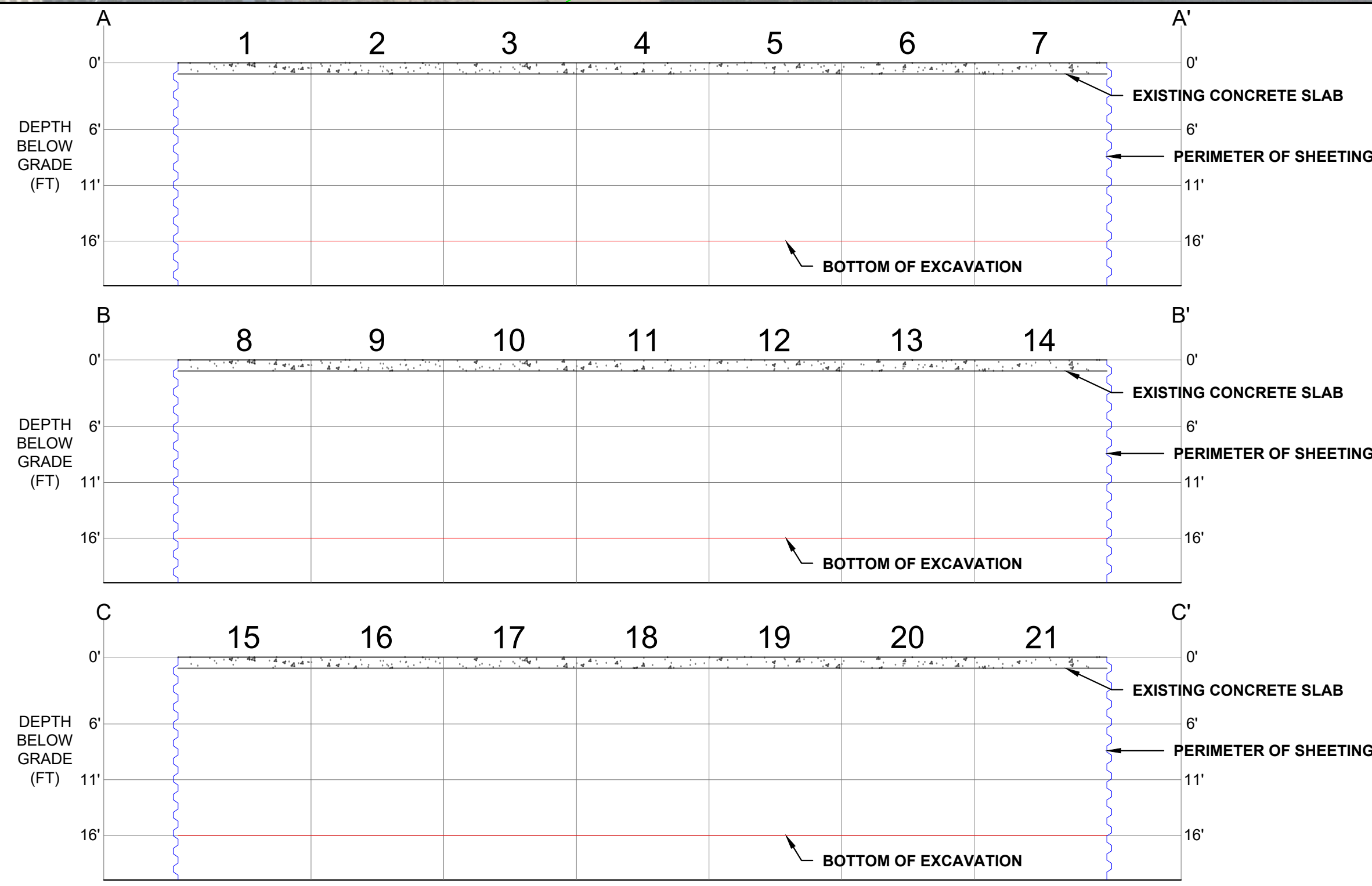
EXCAVATION PLAN

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LEGEND

- EXTENT OF LNAPL IN GROUNDWATER
- EXTENT OF TCE IN GROUNDWATER (≥ 100 µg/L)
- - - - - LIMIT OF EXCAVATION AREA
- 1 WASTE CLASSIFICATION GRID

NOTES

1. THE WASTE CHARACTERIZATION FREQUENCY IS APPROXIMATELY 1 SAMPLE PER 500 CUBIC YARDS. THE SITE WAS DIVIDED INTO 21 GRIDS AND THREE LAYERS IDENTIFIED AS 0-FT TO 6-FT BGS, 6-FT TO 11-FT BGS, AND 11-FT TO 16-FT BGS, FOR A TOTAL OF 63 WASTE CLASSIFICATION CELLS. IN EACH GRID, FIVE SOIL BORINGS WERE ADVANCED TO 16-FT BGS USING A GEOPROBE DIRECT PUSH DRILL RIG. SOILS RECOVERED IN EACH BORING WERE SCREENED FOR VISUAL, OLFACTORY EVIDENCE OF CONTAMINANT, AND INSTRUMENTAL EVIDENCE OF ENVIRONMENTAL IMPACTS VIA A PHOTOIONIZATION DETECTOR (PID).
2. AS PER FACILITY REQUIREMENTS, IN 0-FT TO 6-FT BGS LAYER, ONE DISCRETE AND ONE 5-POINT COMPOSITE SAMPLE WAS COLLECTED. FROM 6-FT TO 11-FT BGS AND 11-FT TO 16-FT BGS, ONE 10-POINT COMPOSITE SAMPLE WAS COLLECTED. COMPOSITE SAMPLE MATERIAL WERE HOMOGENIZED IN A STAINLESS STEEL BOWL. DISCRETE SAMPLES WERE COLLECTED FROM THE SOILS THAT YIELD THE HIGHEST PID READING AND/OR SIGNS OF VISUAL AND OLFACTORY CONTAMINATION. SAMPLES WERE CONTAINERIZED INTO LABORATORY-PROVIDED BOTTLE WARES (5-GRAM TERRACORE OR ENCORE SPECIFICALLY FOR TOTAL VOLATILE ORGANIC COMPOUNDS), PLACED ON ICE IN COOLERS MAINTAINED AT 4°C DEGREES, AND TRANSPORTED UNDER CHAIN OF CUSTODY PROTOCOL TO A STATE DEPARTMENT OF HEALTH (NYSDOH) ENVIRONMENTAL LABORATORY APPROVAL PROGRAM (ELAP)-CERTIFIED LABORATORY.

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NOTE TO REVIEWER

- ADDITIONAL ITEMS NEEDED:**
1. BORING LOCATIONS FROM NYC OFFICE AND COPY ONTO FIGURES
 2. GENERATE A TABLE AND/OR DRAWING SHOWING WASTE CHARACTERIZATION RESULTS ONCE SAMPLING RESULTS HAVE BEEN FULLY ANALYZED.

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WASTE CHARACTERIZATION PLAN

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- LEGEND**
- EXTENT OF LNAPL IN GROUNDWATER
 - - - PROPOSED LNAPL BARRIER SHEET PILE
 - PROPOSED LNAPL RECOVERY WELL LOCATION

- NOTES**
- LOCATION OF ALL EXISTING AND PROPOSED FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE.

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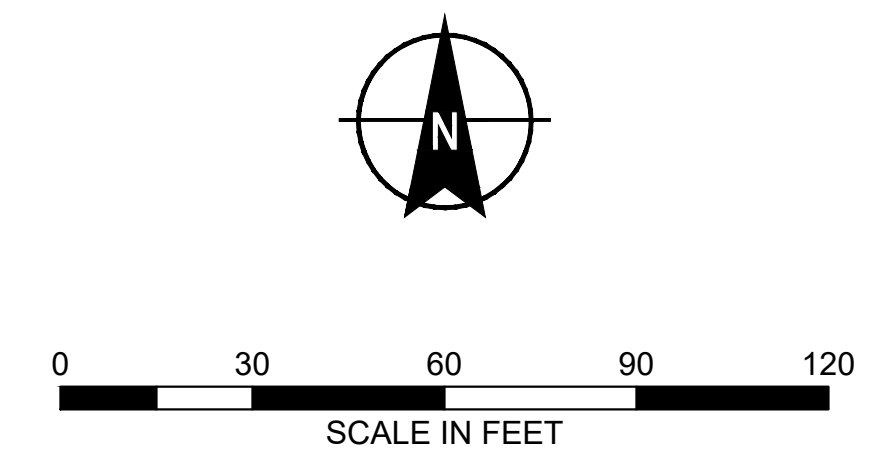
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LNAPL BARRIER/
 LNAPL RECOVERY
 PLAN

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- LEGEND**
- EXTENT OF TCE CONTAMINATION ($\geq 100 \mu\text{g/L}$)
 - MW-1 EXISTING GROUNDWATER MONITORING WELL
 - RW-1 EXISTING PRODUCT RECOVERY WELL
 - PROPOSED VOC GROUNDWATER TREATMENT AREA
 - PROPOSED ON-SITE ZVI MIXING AREA
 - PROPOSED OFF-SITE ZVI INJECTION LOCATIONS AND ASSUMED 10-FT RADIUS OF INFLUENCE

- NOTES**
1. LOCATIONS OF EXISTING MONITORING WELLS, PRODUCT RECOVERY WELLS, IHWDS BOUNDARY, EXTENT OF LNAPL IN GROUNDWATER, AND EXTENT OF TCE CONTAMINATION ARE APPROXIMATE AND REFERENCED FROM ALTERNATIVE WELL LAYOUT FIGURES PREPARED BY GZA GEOENVIRONMENTAL, INC. DATED AUGUST 2016.
 2. BUCKET MIXING OF THE ZVI WITHIN THE ON-SITE SOILS WILL BE PERFORMED FROM 16 FEET BELOW GROUND SURFACE (THE BOTTOM OF THE EXCAVATION) TO 20 FEET BELOW GROUND SURFACE, FOR A MIXING ZONE OF 4 FEET.
 3. INJECTION OF ZVI WITHING THE OFF-SITE SOILS WILL BE PERFORMED USING DIRECT PUSH POINTS FROM 1- FEET BELOW GROUND SURFACE (ASSUMED WATER TABLE DEPTH) TO 20 FEET BELOW GROUND SURFACE, FOR AN INJECTION ZONE OF 10 FEET.



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Designed By:	SAU
Checked By:	SAU
Approved By:	JMB
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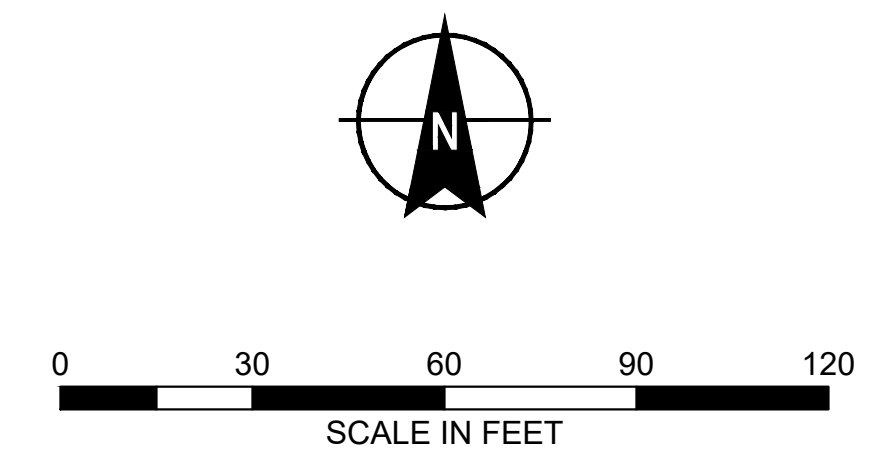
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 FORMER NUHART PLASTIC MANUFACTURING STATE SUPERFUND PROJECT BROOKLYN, NY

VOC GROUNDWATER TREATMENT PLAN

C-303

Sheet: 9 of 12





LEGEND

- GROUND FLOOR LAYOUT OF PROPOSED BUILDING
- EXTENT OF UNDERGROUND PARKING GARAGE
- EXTENT OF SUB-SLAB DEPRESSURIZATION SYSTEM

NOTES

1. LOCATION OF ALL EXISTING AND PROPOSED FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE.
2. LOCATION OF UNDERGROUND PARKING GARAGE AND FIRST FLOOR RETAIL AREA TAKEN FROM FOUNDATION PLAN DWG. NO. F0-100.00 DATED 01/27/2022.
3. ANY BUILDINGS AT THE SITE AND POTENTIALLY IMPACTED BY CONTAMINATED VAPORS WILL BE REQUIRED TO HAVE A SUB-SLAB DEPRESSURIZATION SYSTEM, OR OTHER ACCEPTABLE MEASURE, TO MITIGATE VAPORS INTO THE BUILDING FROM IMPACTED SUBSURFACE SOILS OR GROUNDWATER.
4. A SUB-SLAB DEPRESSURIZATION WILL BE INSTALLED BELOW THE PROPOSED FIRST FLOOR RETAIL AREA. NO SUB-SLAB DEPRESSURIZATION SYSTEM WILL BE INSTALLED UNDER THE PARKING GARAGE DUE TO THE HIGH AIR EXCHANGE REQUIRED IN THE PARKING GARAGE. THE REMAINING SURFACE OF THE NUHART WEST SITE WILL NOT HAVE ANY BUILDINGS DIRECTLY CONSTRUCTED OVER THE SURFACE AND WILL NOT REQUIRE SUB-SLAB DEPRESSURIZATION.
5. THE PROPOSED SUB-SLAB DEPRESSURIZATION SYSTEM WILL BE INSTALLED AS A PASSIVE SYSTEM.
6. MORE DETAILS ON THE SUB-SLAB DEPRESSURIZATION SYSTEM WILL BE PROVIDED IN THE 60% DESIGN.



HALEY & ALDRICH, INC.
 237 W 35th Street, 16th Floor
 New York, NY 10001
 Tel: 646.277.5685
 www.haleyaldrich.com

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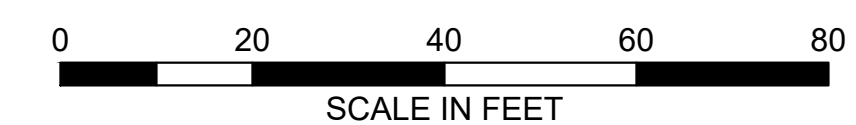
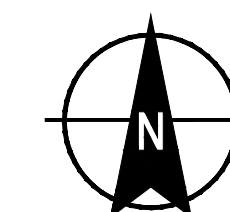
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SUB-SLAB
 DEPRESSURIZATION
 SYSTEM PLAN

C-304

Sheet: 10 of 12



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- LEGEND**
- PROPOSED LNAPL BARRIER SHEET PILE
 - PROPOSED CONCRETE COVER
 - PROPOSED SUB-GRADE PARKING GARAGE
 - PROPOSED VEGETATIVE COVER
 - PROPOSED FIRST FLOOR RETAIL
 - PROPOSED LNAPL RECOVERY WELL LOCATION

- NOTES**
1. LOCATION OF ALL EXISTING AND PROPOSED FEATURES SHOWN ON THIS PLAN ARE APPROXIMATE.
 2. RESTORATION GRADE TO BE DETERMINED BY OTHERS.
 3. ALL FILL MATERIAL BROUGHT ON SITE MUST BE APPROVED BY THE REMEDIATION ENGINEER AND MEET THE REQUIREMENTS OF 6 NYCRR PART 375.6.7(D).

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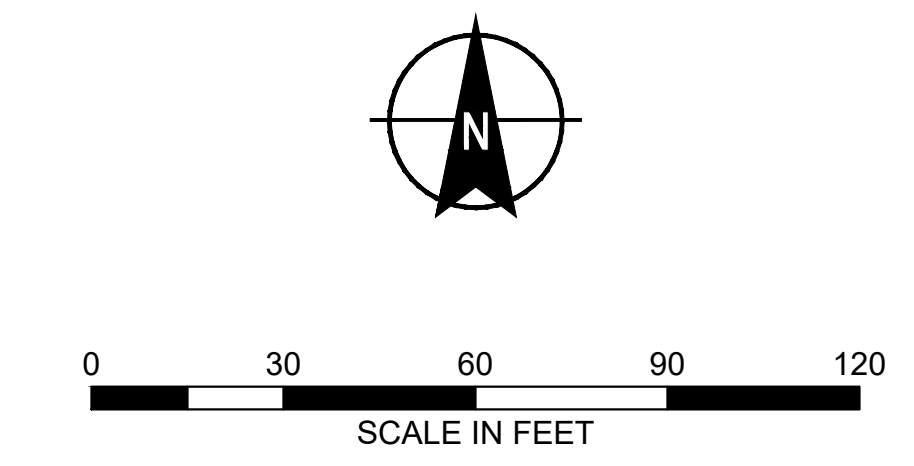
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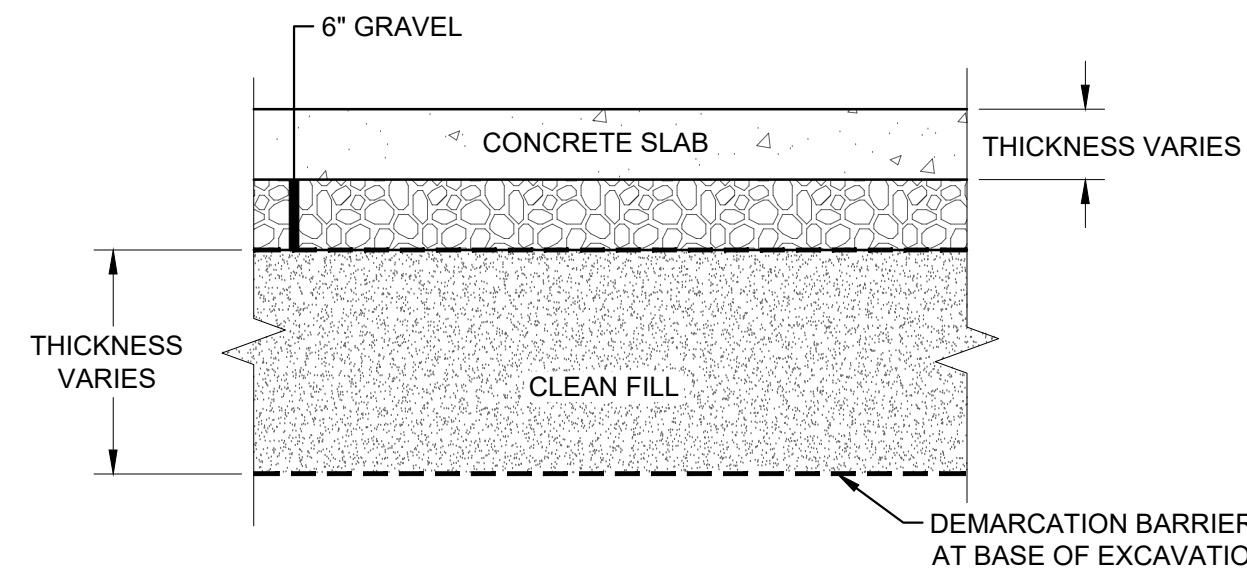
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 BROOKLYN, NY

SITE
 RESTORATION

C-400

Sheet: 11 of 12

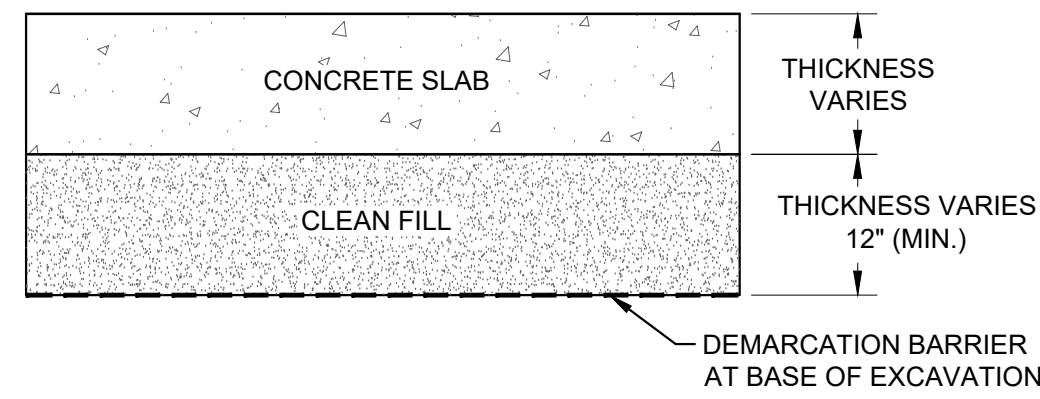




NOTES

1. DIMENSIONS AND FILL MATERIAL TO BE SPECIFIED BY GEOTECHNICAL ENGINEER.

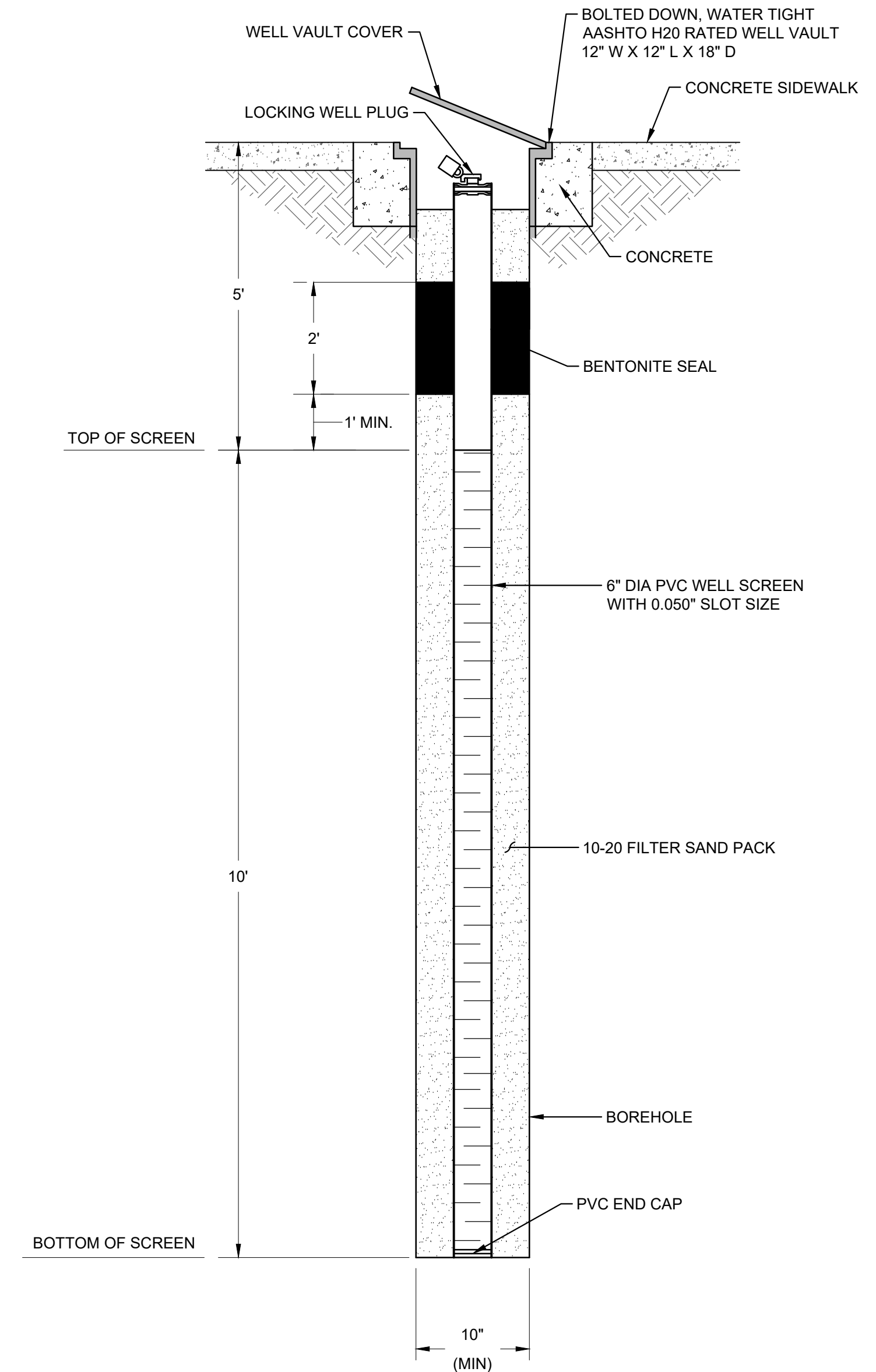
1 PROPOSED CONCRETE COVER
SCALE: NTS



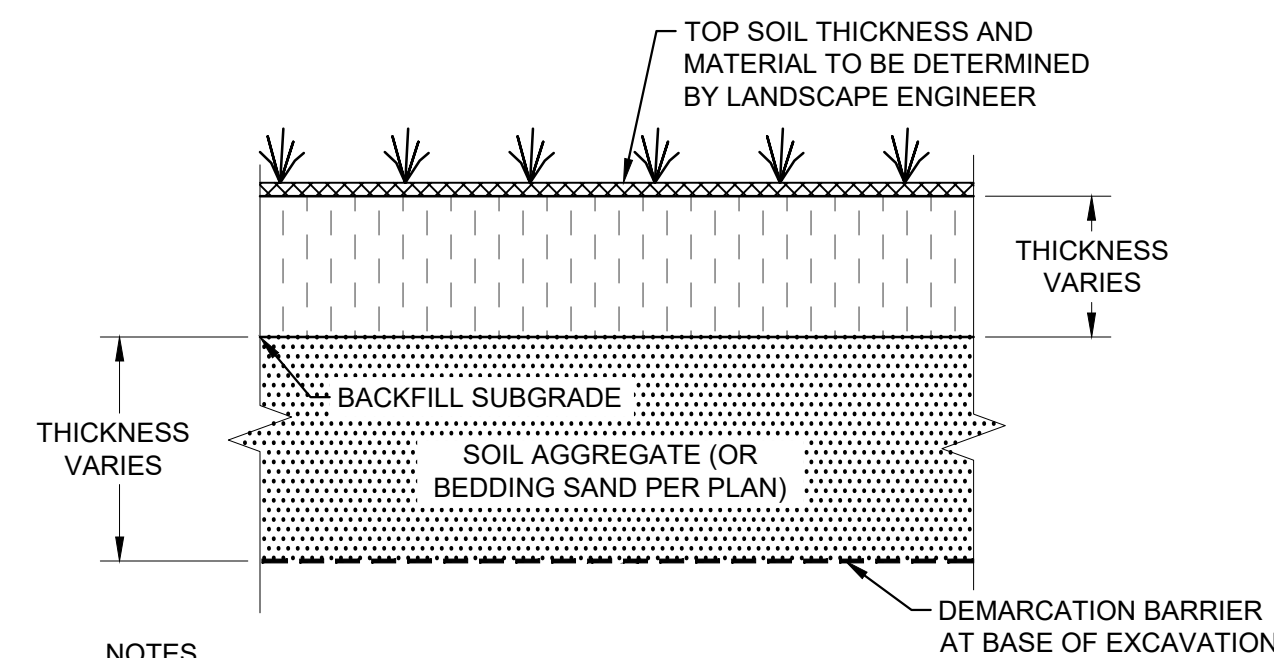
NOTES

1. DIMENSIONS AND FILL MATERIAL TO BE SPECIFIED BY GEOTECHNICAL ENGINEER.

2 PROPOSED SUB-GRADE PARKING GARAGE
SCALE: NTS



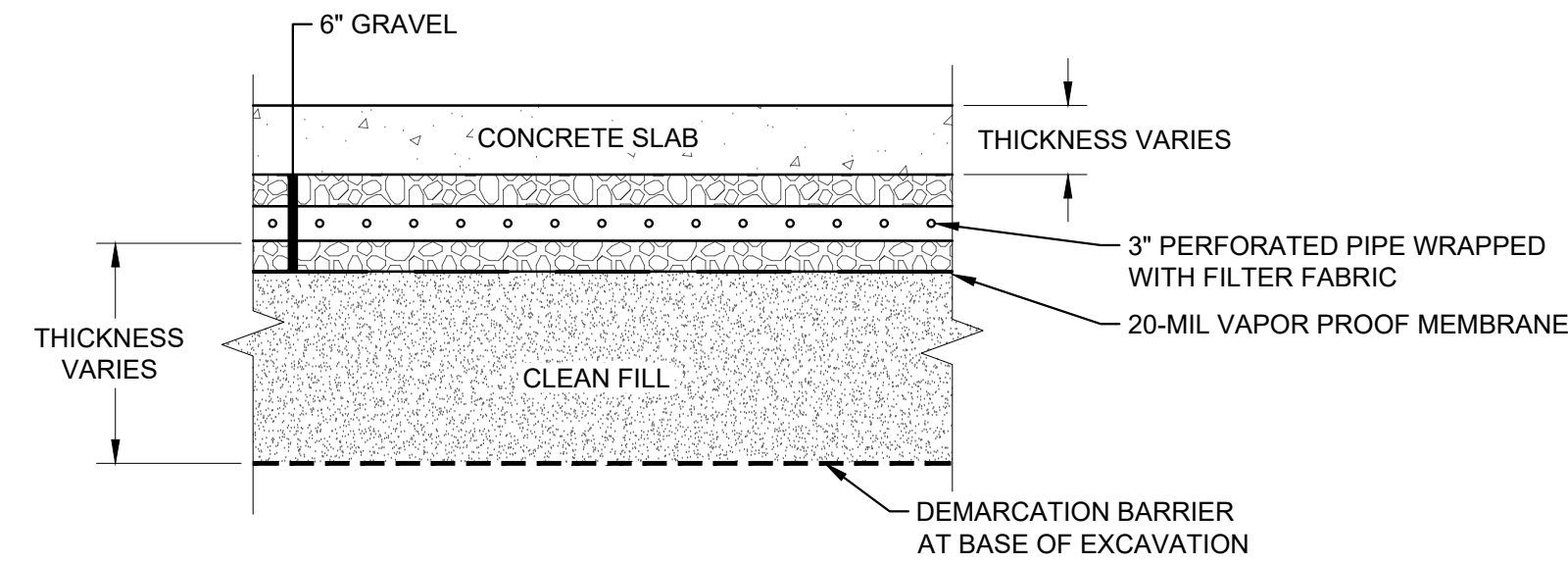
5 RECOVERY WELL
SCALE: NTS



NOTES

1. DIMENSIONS AND FILL MATERIAL TO BE SPECIFIED BY GEOTECHNICAL ENGINEER.

3 PROPOSED VEGETATED COVER
SCALE: NTS



NOTES

1. DIMENSIONS AND FILL MATERIAL TO BE SPECIFIED BY GEOTECHNICAL ENGINEER.
2. MORE DETAILS ON THE SUB-SLAB DEPRESSURIZATION SYSTEM WILL BE PROVIDED IN THE 60% DESIGN.

4 PROPOSED FIRST FLOOR RETAIL
SCALE: NTS

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FORMER NUHART PLASTIC MANUFACTURING STATE SUPERFUND PROJECT BROOKLYN, NY

DETAILS SHEET

C-500

ATTACHMENT 1
Technical Specifications

APPENDIX A

Organizational Chart

APPENDIX B

Citizens Participation Plan

APPENDIX C

Transportation Plan

APPENDIX D

Support of Excavation Plan

APPENDIX E

Community Air Monitoring Plan (CAMP)

APPENDIX F

Construction Contingency Plan

APPENDIX G

Construction Quality Assurance Plan

APPENDIX H

Construction Quality Assurance Project Plan

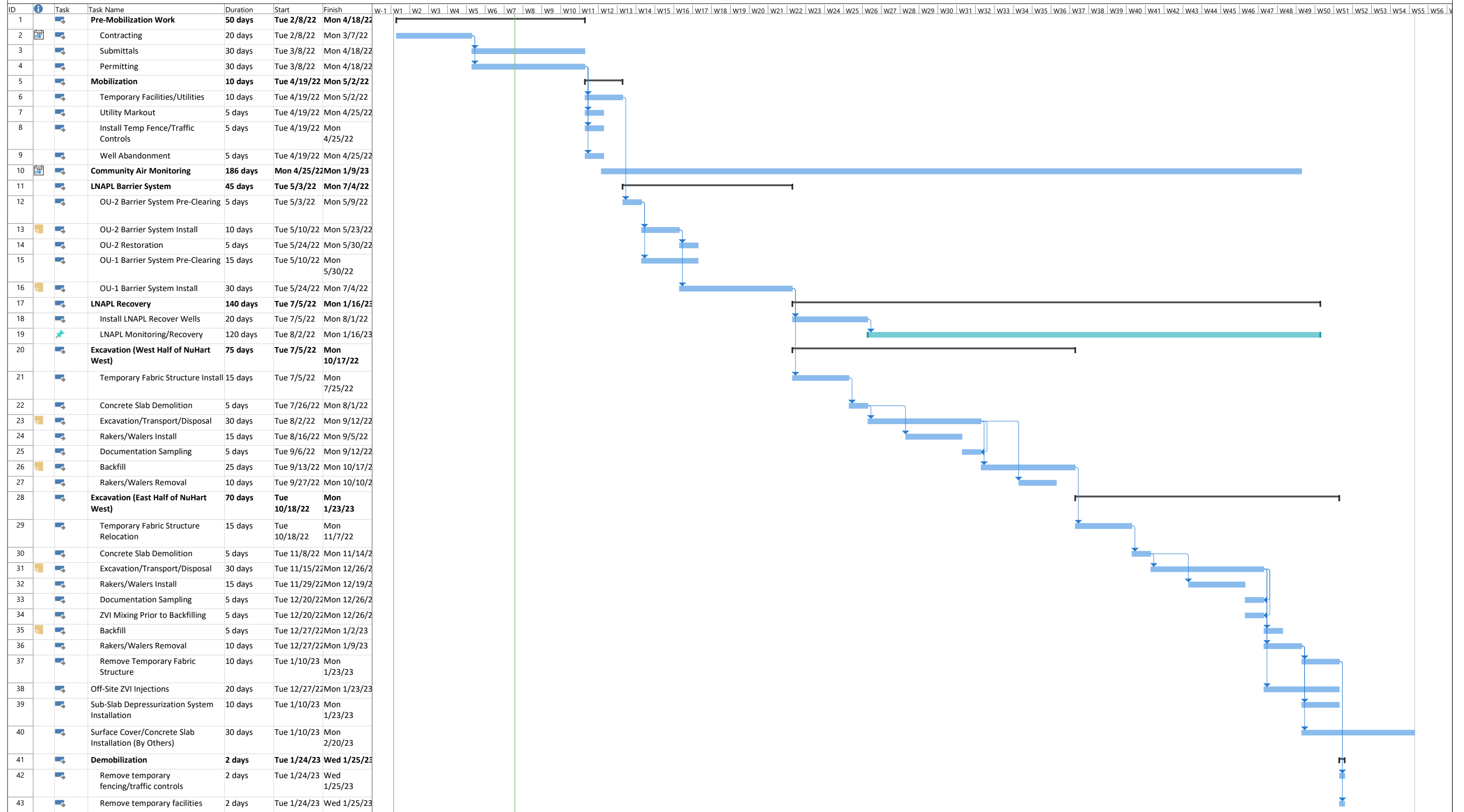
APPENDIX I

Quality Assurance Project Plan

APPENDIX J

Project Schedule

NuArt West Remediation Construction Schedule
30% Design Submittal



Project: NuHart West Remediation Construction Date: Thu 3/24/22	Task		Summary		Inactive Milestone		Duration-only		Start-only		External Milestone		Manual Progress	
	Split		Project Summary		Inactive Summary		Manual Summary Rollup		Finish-only		Deadline			
	Milestone		Inactive Task		Manual Task		Manual Summary		External Tasks		Progress			