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An Environmental Consulting & Remediation Firm
www.ewma.com

Sent Via Email (yywong@gw.dec.state.ny.us) & FedEx Priority Overnight

May 20, 2010

Bryan Wong, Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
47-40 21st Street
Long Island City, New York 11101

Re: ***Remedial Design Report***
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
Long Island City
Queens, New York 11101
BCP No C241098
EWMA Project No. 205490

Dear Mr. Wong:

Enclosed please find one original and one electronic copy of this Remedial Design Report (RDR) for the above-referenced property prepared by EWMA, on behalf of OCA Long Island City, LLC (OCA).

If you have any questions or require any additional information please feel free to contact me at EWMA's Parsippany, NJ office, (973) 560-1400, Ext. 174.

Sincerely,
Environmental Waste Management Associates, LLC

Richard Arnold, Chief Engineer

Enc. One (1) original and one (1) electronic copy

cc: Jane O'Connell, NYSDEC
Bridget Callaghan, NYSDOH
Brent L. Carrier, O'Connor Capital Partners
Michael Bogin, Esq., Sive, Paget, Riesel, PC
Susan Ferrell, AIU
Sharon McSwieney, Project Manager, EWMA

OCA LIC Fifth Street Mixed-Use Housing

Block 28, Lot 21 and 38

LONG ISLAND CITY, NEW YORK

Remedial Design Report For
Lower Sand Unit LNAPL Remediation

NYSDEC BCP Number: C241098

Prepared for:

OCA LIC, LLC
O'Connor Capital Partners
535 Madison Avenue, 23rd Floor
New York, NY 10022

Prepared by:

Environmental Waste Management Associates/EWMA Engineering Services LLC
100 Misty Lane
Parsippany, NJ 07054
EWMA Project No. 205490

MAY 2010

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CERTIFICATION FOR REMEDIAL DESIGN REPORT

I, Richard D. Arnold, am currently a registered professional engineer licensed by the State of New York. I am the Project Remediation Engineer and have primary direct responsibility for implementation of the remedial program for the OCA LIC Fifth St. Mixed-Use Housing Site (NYSDEC BCA Index No. A2-0584-0307, Site No. C241098).

I certify that the information presented in this Remedial Design Report (RDR) is in substantial compliance with the requirements for this category of report as presented in the NYSDEC Draft Brownfield Cleanup Program Guide dated May 2004, and in the NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation dated December 2002.

I certify that the information presented in this RDR is in compliance with and supportive of the intent of and requirements set forth within the NYSDEC BCP approved July 2009 RAWP.

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

Note: include PE stamp

By EWMA Engineering Services LLC
NYS Certificate of Authorization No.0005216

5/20/2010

Richard D. Arnold, NYSPE No. 16 076202
EWMA Project Number 205490

It is a violation of Article 145 Section 7209(2) of New York State Education Law for any person, unless he is acting under the direction of a licensed professional engineer, to alter any information item within this RDR in any way.

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

The Site known as OCA LIC Fifth Street Mixed-Use Housing (OCA LIC) is located at 5-20 46th Road, City of New York, Queens County, New York (the Site). It is part of an old industrial portion of the City of New York, Queens County, New York. The East River is the closest water body located approximately ¼-mile west of the Site. The Site is L-shaped with approximately 300 feet of frontage along the southern side of 46th Road, 200 feet of frontage along the eastern side of the 5th Street, and 100 feet of frontage along the northern side of 47th Avenue.

In 2008, buildings on the Site were demolished to street grade. During current implementation of the approved RAWP and an approved underground storage tank Interim Remedial Measures (IRM) Work Plan, remaining concrete floor slabs and other subsurface structural elements are being removed, underground storage tanks are being closed, site soils are being excavated, and wastes are being transported off site for disposal. In addition, end point sampling and analysis is being performed, the completed excavation floor areas are being covered with geotechnical fabric and imported clean stone fill, and project control activities including nuisance dust control, health and safety procedures, community air monitoring, and notification and reporting are being implemented as required under the RAWP.

During the remedial investigation, a stratum of peat and clay was detected in the subsurface beneath fill and other soil materials, and a sand unit consisting primarily of medium to fine silty sand was detected below the peat and clay stratum. The upper surface of the peat and clay stratum was found to range from about 10-feet to 13-feet below ground surface (bgs) and the stratum was encountered in typical thicknesses of about two-feet. In the eastern sector of the Site, light non-aqueous phase liquid (LNAPL) was observed in the lower sand unit. The ground water flow direction in this lower sand unit is southwestward toward the East River.

Based on the remedial investigation findings, NYSDEC determined that the presence of LNAPL in the lower sand unit required a remedial system, and the technical approach described in this Remedial Design Report (RDR) was developed in consultation with NYSDEC. LNAPL contamination identified in the lower sand unit will be provided for via installation of a capture wall, installation of collection and recovery wells, and use of down-well skimming equipment to remove the free product collected in the wells. Also, monitoring and remediation wells will be installed for future ground water monitoring and as-needed LNAPL recovery. This approach was included in the RAWP Section 3.3 as part of the selected remedy, and the RAWP was subsequently approved by NYSDEC in July 2009.

In accordance with the Draft Brownfield Cleanup Program Guide (BCP Guide), a remedial design (RD)

may be appropriate: 1) when the proposed remedy includes treatment systems where the performance of the remedy is dependent upon the careful specification of sizes, capacities, process control, etc; or 2) when implementing the remedy requires specialized engineering or specialized construction e.g. a barrier wall. NYSDEC determined that an RD was required for remediation of the LNAPL in the lower sand unit. This document fulfills that NYSDEC requirement. This RDR follows the guidance provided in Section 5.2(b) of DER-10 and the guidance provided in Section 5.3 of DER-10.

1.2 GUIDANCE AND REFERENCE DOCUMENTS

For the purpose of providing compliance with NYSDEC/BCP rules when developing this RDR, the following generic and site specific guidance and reference documents were utilized:

- May 2004 Draft Brownfield Cleanup Program Guide;
- May 2007 Generic Template for Final Remedial Action Work Plan;
- December 2002 Draft DER-10 Technical Guidance for Site Investigation & Remediation; and
- July 2009 OCA LIC Revised Remedial Action Work Plan

1.3 RDR OBJECTIVES

This RDR has been prepared to comply with NYSDEC BCP requirements and to support OCA LIC with their intent to move forward expeditiously with the Site development work. Accordingly, this work plan has been developed with the following objectives:

- Comply with the NYSDEC BCP requirement to provide an RD for an LNAPL Remediation System for Lower Sand Unit LNAPL Remediation in accordance with the approved remedy presented in the RAWP as Alternative #4;
- Support expeditious Site development by submitting design plans and specifications, rather than submitting preliminary design documents as is standard under governing guidance document DER-10 Section 5.2;
- Support expeditious Site development by submitting an operation, maintenance and monitoring plan, rather than submitting an outline for the OM&M Plan as is standard under governing guidance document DER-10 Section 5.2.

2.0 PERTINENT DECISION DOCUMENTATION

In accordance with governing guidance document DER-10 Section 5.2, the Remedial Investigation Report (RI Report) should be presented as the first section of the RDR. However, the RI Report has previously been submitted as a stand-alone document, and a summary of the RI Report has been included within the approved RAWP.

Therefore, per DER-10 Section 5.2, it is sufficient to submit a copy of this decision document, which in this case is the NYSDEC BCP July 24, 2009 RAWP approval. A copy of the decision document is provided in Appendix A of this RDR.

3.0 SUMMARY TABLE OF SAMPLING RESULTS

The Site was investigated in accordance with the scope of work presented in the NYSDEC-approved Remedial Investigation (RI) Work Plan dated January 25, 2008 and subsequent Addenda dated February 1, 2008, February 20, 2008 and June 25, 2008.

The investigation was conducted between February and December 2008. The RIR was forwarded to NYSDEC on September 3, 2008 and comments from NYSDEC were received in a letter dated October 10, 2008. A revised RIR was submitted by OCA on December 22, 2008 and updated March 3, 2009.
In accordance with DER-10 Section 5.2, a summary table of pre-remediation sampling results is to be provided in the RDR. The required summary table is provided in Appendix B of this RDR.

4.0 IDENTIFICATION OF SCGs

As a part of the approved remedial action work planning process, the remediation of LNAPL in the lower sand unit was included in the selected remedial alternative (Alternative #4 of the July 2009 RAWP) and this selected alternative was evaluated for Standards, Criteria and Guidelines (SCG) compliance. Alternative #4 was found to be in compliance with Standards, Criteria & Guidance (SCGs) as implemented through the NYSDEC Volunteer BCP as follows:

- 6 NYCRR Part 375-6 Soil Cleanup Objectives (SCOs) – This SCG item applies to Alternative #4 because the soils at this inactive Site are impacted by wastes and in some cases in excess of the SCOs.
- New York State Ground Water Quality Standards 6 NYCRR Part 703 – This SCG item applies to Alternative #4 because the Site ground water is impacted in excess of NYS ground water quality standards.
- NYSDEC Ambient Water Quality Standards and Guidance Values TOGS 1.1.1 – This SCG item applies to Alternative #4 because the up-gradient off-site ground water is impacted in excess of ambient standards.
- NYSDEC Draft DER-10 Technical Guidance for Site Investigation and Remediation December 2002 – The SCG item in this document is currently superceded by BCP rules and guidelines.

- NYSDEC Draft Brownfield Cleanup Program Guide May 2004 – This SCG item applies to Alternative #4 because Alternative #4 is a remedial alternative evaluated in accordance with the NYSDEC BCP.
- New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan – This SCG item applies to Alternative #4 as a means of monitoring the effectiveness of nuisance controls as required under the NYSDEC BCP.
- NYS Waste Transporter Permits 6 NYCRR Part 364 – This SCG item applies to Alternative #4 because contaminated soil off-site transportation would be a part of this alternative.
- NYS Solid Waste Management Requirements 6 NYCRR Part 360 and Part 364 – This SCG item applies to Alternative #4 because off-site disposal of contaminated soil would be a part of this alternative.

5.0 DESCRIPTION OF THE REMEDIAL ACTION

In accordance with NYSDEC BCP and DER-10 guidance, this description of the remedial action for LNAPL in the lower sand unit, in the eastern sector of the Site, includes a discussion of the conceptual remedial approach, a system design and installation plan for an LNAPL Remediation System, a discussion of installation work controls and requirements, and system OM&M requirements. As stated in the RAWP, the LNAPL in the lower sand unit originates from an up-gradient off-site source or sources, but now resides beneath the Site.

5.1 CONCEPTUAL REMEDIAL APPROACH

Based on the remedial investigation findings, NYSDEC determined that the presence of LNAPL in the lower sand unit required mitigation. A technical approach to the required mitigation was developed interactively with NYSDEC and was included in the RAWP as a part of the selected remedy, RAWP Alternative #4. The RAWP was subsequently approved by NYSDEC via correspondence dated July 29, 2009.

The sand unit of concern is in the eastern sector of the Site, beneath a low-permeability peat and clay layer. LNAPL is present within the sand unit flow regime, and is driven by low specific gravity to reside within the upper portion of the water column in this unit, directly beneath the peat and clay layer. Ground water flow in the sand unit is southwestward through the LNAPL impacted area and across the Site.

There is regulatory concern that the lower sand unit LNAPL, even though as stated in the RAWP it originates from an up-gradient off-site source or sources, may impact groundwater on-site and move further downgradient. In addition, there is regulatory concern that the off-site source or sources will

continue to re-contaminate the Property, and may require future ground water monitoring and/or mitigation.

In response to these concerns, a capture wall will be installed to mitigate LNAPL migration across the Site from the impacted area. The wall will be installed in the form of an in-situ weir, down-gradient of the LNAPL plume, to function in a manner similar to that of an oil-water separator. As ground water flows slowly within the impacted flow regime and approaches the capture wall, it will migrate down and beneath the lower boundary of the wall. The lower density LNAPL will remain resident within the upper portion of the water column and will gradually build up behind the capture wall where it will be removed with the use of five 6-inch diameter recovery wells and down-well skimming equipment.

In response to NYSDEC's concerns regarding possible re-contamination and possible future monitoring and/or mitigation, a total of thirty eight wells will be installed with auger drilling methods. Five wells will be installed directly up-gradient of the capture wall to provide a means of collecting and recovering LNAPL from that location. Twenty wells will be installed up-gradient of the capture wall in the future garage area and across the lower sand unit LNAPL plume area, to provide a means for future ground water monitoring, as-needed injection of treatment agents, or as-needed LNAPL recovery. Four wells will be installed down-gradient of the capture wall in the future garage area for monitoring and as-needed LNAPL recovery purposes. Nine wells will be installed around the perimeter of the site in the sidewalk area for monitoring and as-needed LNAPL recovery purposes.

In addition, as a contingency, a concrete vault will be installed directly adjacent to the 46th Street sidewalk area and opposite the capture wall "V" as shown in the Appendix G Final Drawings and Specifications. The vault will be outside of the planned building, and the top of vault will be completed at planned development ground surface elevation for future accessibility. The vault will be provided with appurtenances for future utility connections and will be designed to receive an interim storage tank for future use, if it becomes necessary to conduct automated skimming or fluid extraction.

Finally, upon installation of the capture wall and the wells up-gradient of the wall in the future garage area, the installed LNAPL Remediation System will be tested during a one week period to confirm system effectiveness. The test results will then be included in the Final Engineering Report (FER). The testing work will be performed with use of a portable down-well skimming system such as a Spill Buddy®. The Spill Buddy® is a compact, manual, free product skimming system, designed to be operated on site to skim quantities of product (LNAPL or DNAPL). The Spill Buddy's operation is based on the state-of-the-art ALPHA-ARRAY™ sensors in the probe that detect the interface between the product and the water. An audible feedback signals the user to keep the pump positioned in the product layer, and allows product skimming with virtually no water pumped.

After installation and testing of the LNAPL remediation system, the system will be operated during a transition period until receipt of NYSDEC approval of the Site Management Plan (SMP). Upon NYSDEC approval of the SMP, the LNAPL remediation system will be operated in accordance with the approved SMP.

As presented in Section 5.4 and in Appendix F of this RDR, the transition period operations will consist of twice monthly visits to the site and twice monthly measurements of water levels and LNAPL thicknesses in the LNAPL related wells. During the visits, the Spill Buddy will be used to recover product from wells when product is detected in recoverable thicknesses.

5.2 GENERAL SYSTEM DESIGN AND INSTALLATION PLAN

The three primary components of the planned LNAPL Remediation System are the capture wall, wells, and future storage vault. The system design and installation plan for these components is set forth below.

5.2.1 Components, Materials and Layout

The capture wall will be constructed with pile hammer-driven AZ14-700 steel interlocking sheet piles, in a shallow V-shaped layout for entrapment of LNAPL that may migrate from the up-gradient impacted area to the wall location. The AZ14-700 sheets will be driven in pairs, with the sheets of each pair seal welded together in the factory, and with interlock connections between pairs sealed with factory installed Adeka P201 expansive grout sealant. Five 6-inch diameter PVC recovery wells will be installed directly up-gradient of the wall. The recovery wells will be installed with 10-slot screens and 0-Morie gravel packs, and will sealed through the peat and clay layer with a minimum two feet of granulated bentonite overlain by a column of well grout from top of bentonite up to bottom of well sump. The recovery wells will be completed within flush mount well sumps in the planned garage floor. The wells will be used for LNAPL recovery with a portable Spill Buddy®. The wall location and recovery well locations and associated details are displayed within the Appendix G Draft Final Plans and Specifications.

Twenty-four wells will be installed as couplets in the future garage area, with twenty wells up-gradient of the capture wall and four wells down-gradient of the capture wall. Nine wells will be installed around the site perimeter in the future sidewalk area. All of these wells will be 4-inch diameter PVC wells with 10-slot screens and 0-Morie gravel packs. The screen slot and gravel pack sizes have been carefully selected to match the silty sand matrix in which they will be installed, and to minimize infiltration of soil materials during extraction and injection stresses associated with possible future use of treatment technologies. All of these wells will sealed through the peat and clay layer with a minimum two foot thick layer of granulated bentonite overlain by a column of well grout from top of bentonite up to bottom of well sump. At each couplet location, one well will be screened directly beneath the peat and clay layer, and one well will be screened at a location that is deeper within the sand unit. The well risers from the couplet

locations will be sealed in the peat and clay layer as described above. The nine wells in the perimeter sidewalk area will screened directly below the peat and clay layer. The risers from these wells will be sealed in the peat and clay layer as described above and will be installed integrally with the surface of the concrete sidewalk. The well locations and associated details are displayed within Appendix G, Final Plans and Specifications, and the completion details for all of the wells are presented in Note 2 of the Monitoring/Remediation/Recovery Well Specification on Drawing LN-2 also in the Appendix G Final Plans and Specifications.

The future storage vault will be roughly 6-feet in depth, eight-feet in width, and sixteen-feet in length with step rungs at each end. It will have a removable traffic rated cover with manholes at each end for access and will be pre-cast concrete with reinforcement. It will be installed directly adjacent to the 46th Street sidewalk area and opposite the capture wall "V" as shown in the Appendix G Final Drawings and Specifications. It will be outside of the planned building, and the top of vault will be completed at planned development ground surface elevation for future accessibility. The vault will be provided with appurtenances for future utility connections and will be designed to receive an interim storage tank for future use, if it becomes necessary to conduct automated skimming or fluid extraction.

5.2.2 Planned System Locations

The planned system locations are illustrated within Appendix G Final Plans and Specifications.

5.2.3 System Operating Conditions

LNAPL monitoring and recovery from the wells up-gradient of the wall will be performed with trained personnel using portable down-well skimming units. The skimming units include integral small quantity storage containers and can also be used to discharge recovered product into interim storage drums. The drums can then be moved with drum trucks for transfer to secondary contained storage units. The recovered product will be accumulated in the secondary contained storage units, properly characterized, and transported and disposed to an appropriate off-site disposal facility. Alternately, the recovery can be performed with the use of vacuum tankers and extension hoses, with the recovered product slurped directly from each well into the tanker, properly characterized, and transported and disposed to an appropriate off-site disposal facility. The LNAPL recovery, storage, transport and disposal will be documented and performed in accordance with standard environmental practices and all applicable Federal, state and local rules and regulations.

5.2.4 Treatment Systems

If necessary, the installed system is suitable for the use of enhanced fluid extraction methods and is suitable for the use of injected sodium persulfate, sodium lactate, biosolve surfactant, and various nutrients. The system is not designed for the injection of potentially explosive or highly reactive agents

such as oxygen, ozone, or Fenton's reagents, which are not suitable for use within the garage area given the development plan.

In the event that future treatment is required, volume and density application rates are to be based on the manufacturer's recommendations, and specific steps are to be performed prior to treatment. A letter from the manufacturer stating the recommended dosage rates, design plans for injection and reinjection, as-built drawings and diagrams, and manufacture's documentation and calculations are to be provided to NYSDEC for review and approval prior to initiation of any treatment activity.

5.2.5 Processes and Materials

At the present time, no special processes or materials are to be employed. Standard construction and environmental protection procedures are to be used for the installation of the capture wall, monitoring and recovery wells, and future storage vault, and for the recovery and management of liquid wastes.

5.2.6 Scaled Site Location Map

A scaled site location map is presented within the Appendix G Draft Final Plans and Specifications.

5.3 INSTALLATION WORK CONTROLS AND REQUIREMENTS

Installation work controls and requirements are set forth below in the form of City permit requirements and good practices and OSHA NYSDEC environmental control plans.

5.3.1 Permit Requirements and Good Practices

Prior to initiation of the work, requirements for compliance with City building codes and permits will be checked and compliance steps will be performed. In addition, the Site storm water pollution prevention plan and erosion and sedimentation prevention plans will remain in effect. Site security practices, traffic control measures, work hours, and noise control measures will remain in effect. BCP signage will continue to be displayed. Odor, dust, and other nuisance control measures will remain in effect.

5.3.2 Site Specific Health & Safety Plan (HASP)

The site specific health & safety plan (HASP) for this project is the same as the HASP used for work performed under the NYSDEC approved RAWP dated July 2009. The HASP will be applied during the installation work based upon potential for contact and characterization of work tasks.

5.3.3 Community Air Monitoring Program (CAMP)

The site-specific Community Air Monitoring Plan (CAMP) that has been developed for the Site is provided in Appendix D, with modifications suitable for the installation activities that are planned.

5.3.4 Contractors Site Operations Plan (SOP)

A contractor's site operations plan will be prepared and submitted to NYSDEC for review and approval after approval of the RDR and prior to initiation of LNAPL remediation operations.

5.3.5 QAPP for Sampling and Analysis

The need for sampling and analysis during the installation of the LNAPL remediation system will be minor. The site QAPP is the same as the QAPP used for work performed under the NYSDEC approved RAWP dated July 2009.

5.4 SYSTEM OM&M REQUIREMENTS

As stated in Section 5.1, after installation and testing of the LNAPL remediation system, the system will be operated during a transition period until receipt of NYSDEC approval of the Site Management Plan (SMP). The transition period operations will consist of twice monthly visits to the site, twice monthly measurements of water levels and LNAPL thicknesses in the LNAPL related wells, and twice monthly removal of recoverable LNAPL from the wells.

The OM&M outline plan for the transition period is presented below:

- Equipment catalog cut sheets will be maintained at the Site for the Spill Buddy®;
- Staff performing the recovery operations will comply with the HASP;
- Water levels and LNAPL thicknesses will be measured twice monthly;
- The Spill Buddy® will be used to recover product from wells when product is detected;
- Recovered liquids will be stored, transported and disposed in accordance with the applicable waste management regulations;
- Monthly letter reports of findings that document the water level, product thickness, recovery, and disposal information will be provided the NYSDEC.

As required, an OM&M outline plan is provided in Appendix F of this RDR.

It should be noted that system OM&M will be addressed in greater detail within the forthcoming Site Management Plan (SMP).

6.0 PROPOSED SCHEDULE

The schedule presented below is proposed to comply with NYSDEC BCP compliance requirements and to support expeditious OCA LIC Site development activities.

Proposed Activity	Proposed Schedule
• Receive NYSDEC RDR Comments	May 17, 2010

- Submit Revised Final RDR to NYSDEC — May 20, 2010
- Receive Final RDR Approval from NYSDEC — May 24, 2010
- Submit Site Management Plan to NYSDEC — May 31, 2010
- Complete LNAPL Remediation Installations — June 30, 2010
- Submit Final Engineering Report to NYSDEC — August 31, 2010

APPENDIX A – OCA LIC
DECISION DOCUMENTATION

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 2
47-40 21ST Street, Long Island City, NY 11101-5407
Phone: (718) 482-4995 • **FAX:** (718) 482-6358
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

July 24, 2009

Mr. Brent Carrier
OCA Long Island City, LLC
c/o O'Connor Capital Partners
535 Madison Avenue, 23rd Floor
New York, NY 10022

RE: OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road, Long Island City, Queens, New York 11101
BCP Site # C241098
Final Remedial Action Work Plan Dated July 2009

Dear Mr. Carrier:

The New York State Department of Environmental Conservation (NYSDEC), in consultation with the New York State Department of Health (NYSDOH), has completed its review of the Remedial Investigation Report dated March 2009 (prepared by Environmental Waste Management Associates) and the final Remedial Action Work Plan dated July 2009 (prepared by EWMA Engineering Services LLC). The documents were submitted to NYSDEC and NYSDOH on behalf of OCA Long Island City, LLC (the Volunteer) under the Brownfield Cleanup Program for project number C241098.

A draft of the Remedial Action Work Plan (draft RAWP) dated December 2008 was released for public comment for 45 days as required by program policy. That comment period ended on March 11, 2009. NYSDEC determined that the draft RAWP was not acceptable. The RAWP was revised, and the revised RAWP dated March 2009 was released for public comment for an additional 30 days with the comment period ending on May 3, 2009.

The Remedial Investigation Report is hereby approved. The final Remedial Action Work Plan (RAWP) dated July 2009 is deemed to be appropriate and protective of public health and the environment and is hereby approved. The approved RAWP along with the enclosed decision document must be placed by the Volunteer in all publicly accessible repositories for the project within 5 business days. A certification that these documents have been placed in project repositories, and that the repositories are complete with all project documents, must be submitted to the NYSDEC project manager.

We request that you distribute and certify distribution of the NYSDEC-approved Fact Sheet announcing the commencement of the remedial construction work to be performed under the RAWP. A certification of mailing of that fact sheet to the project contact list must be provided to the NYSDEC project manager. The certification must also include the date of release, a list of recipients, a copy of the fact sheet released, and a statement that no changes were made to the fact sheet after approval by NYSDEC.

The Volunteer and its contractors are solely responsible for safe execution of all invasive and other work performed under the RAWP. In particular, the Volunteer and its contractors are

responsible for the structural integrity of excavations, and protection of the structural integrity of buildings, utilities, and other structures both onsite and offsite that may be adversely affected by those excavations. The Volunteer and its contractors must obtain all local, state or federal permits or approvals that may be required to perform work under the RAWP. Further, the Volunteer and its contractors are solely responsible for the identification of utilities that might be affected by work under the RAWP and implementation of all required, appropriate, or necessary health and safety measures during performance of work under the approved RAWP.

In accordance with the schedule presented in the approved RAWP, equipment mobilization will begin approximately 5 days following the date of this letter. Any proposed changes or modifications to the implementation schedule should be provided to the NYSDEC project manager for review and approval. Daily reports shall commence upon equipment mobilization.

If you have any questions regarding this matter please contact me at (718) 482-4905.

Sincerely,

Bryan Wong
Environmental Engineer

cc: Jane O'Connell, Christopher Horan, Louis Oliva – NYSDEC
Bridget K. Callaghan – NYSDOH
Michael Bogin – Sive, Paget & Riesel, PC
Sharon McSweeney, Richard Arnold – EWMA

APPENDIX D – OCA LIC
COMMUNITY AIR MONITORING PROGRAM

COMMUNITY AIR MONITORING PLAN FOR INSTALLATION OF LNAPL REMEDIATION UTILITIES

Property Known As:

OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
Long Island City, Queens County, New York 11101
BCP Site #C241098

Prepared for:

OCA Long Island City, LLC
c/o O'Connor Capital Partners
535 Madison Avenue, 23rd Floor
New York, NY 10022

April 2010

Submitted by:

EWMA
P. O. Box 5430
Parsippany, New Jersey 07054
EWMA Case No. 205490

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APPENDICES

Community Air Monitoring Plan (CAMP)
For Installation of LNAPL Remediation Utilities
OCA LIC Fifth Street Mixed-Use Housing
5-20 46th Road
Long Island City, Queens County, New York 11101
BCP Site # C241098
EWMA Job #205490

1.0 INTRODUCTION AND PURPOSE

EWMA has prepared this Community Air Monitoring Plan (CAMP) for implementation during intrusive activities that will consist of the installation of LNAPL remediation utilities (capture wall, recovery and extraction wells, monitoring wells) that are proposed in the March 2010 Remedial Design Work Plan (RDWP) for Lower Sand Unit LNAPL Remediation for the property known as the Former Accurate Associates Site, which is located at 5-20 46th Road, Long Island City, New York (subject property and site). EWMA was retained by OCA Long Island City, LLC (OCA) to prepare and implement the RDWP to support compliance with Brownfield Cleanup Program (BCP) requirements.

The purpose of this CAMP is to provide a measure of protection to the surrounding community including residences, businesses, and on site employees from potential airborne releases as a direct result of the intrusive activities that will consist of the installation of LNAPL remediation utilities at the site. This plan is not intended for use in establishing action levels for worker exposure protection, as this is addressed in the site-specific Health and Safety Plan (HASP).

During the implementation of remedial Phase I-IV, soil was excavated to 7' below surface grade (bsg), geotechnical stabilization and warning fabric was placed on the excavation floor, and the fabric was covered with certified clean imported quarry process fill. This barrier will minimize any potential release of dust and odors during the planned installation work. In addition, and if necessary, dust and odor suppression measures including but not limited to use of polyethylene sheeting, Biosolve foam, water sprays, etc. will be implemented during the work. Automated CAMP air monitoring stations will be setup and in place during the installation work to provide continuous monitoring of dust and organic vapors within the immediate work area and at designated stations at the down wind side of the property. One upwind station will be set up to monitor any dust and organic vapors coming from offsite sources upwind.

2.0 WORK AREA AIR MONITORING PLAN

The work area (i.e. exclusion zone) will be monitored for volatile compounds as outlined in the site specific HASP.

Real-time air monitoring for volatile compounds and particulate levels at the perimeter of the exclusion zone (i.e. immediate work area) will be performed during intrusive activities to protect the surrounding community including residences, businesses, and on site employees from potential airborne releases as a direct result of the intrusive remedial utility installation work on the site. Volatile compounds will be monitored utilizing

properly calibrated photoionization detectors (PIDs). The particulate levels will be monitored using direct read dust monitors. The volatile organic compound and particulate monitoring programs are discussed in detail below in Sections 2.1 and 2.2. A figure depicting the CAMP locations has been enclosed as **Appendix 1**.

2.1 Volatile Organic Compound Monitoring

Volatile organic compounds will be monitored at the downwind perimeter of the work area on a continuous basis. If total organic vapor levels exceed 5 parts per million (ppm) above background, work activities will be halted and monitoring continued under the provisions of the Vapor Emission Response Plan (see Section 3.0). All readings will be recorded and be available for state (NYSDEC and NYSDOH) personnel to review.

2.2 Particulate Monitoring

Visual observations will be made during all work activities to monitor for dispersion outside the immediate work area. Dust suppression techniques may include applying water or water with hygroscopic salts to the disturbed soil, reducing the volume and speed of on-site vehicles, and wet sweeping paved areas. All readings will be recorded and be available for state (NYSDEC and NYSDOH) personnel to review.

3.0 VAPOR EMISSION RESPONSE PLAN

If the ambient air concentration of organic vapors exceeds 5 ppm above background at the perimeter of the work area, activities will be halted and monitoring continued. If the organic vapor level decreases below 5 ppm above background, work activities will resume. If the organic vapor levels are greater than 5 ppm over background but less than 25 ppm over background at the perimeter of the work area, activities will resume provided:

- The organic vapor level 200 feet downwind of the perimeter of the work area, or half the distance to the nearest residential or commercial structure, whichever is less, is below 5 ppm over background.

If the organic vapor level is above 25 ppm at the perimeter of the work area, activities will be shutdown. When work shutdown occurs, downwind air monitoring as directed by the Safety Officer will be implemented to ensure that vapor emissions do not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission section.

4.0 MAJOR VAPOR EMISSION MONITORING

If any organic levels greater than 5 ppm over background are identified 200 feet downwind from the perimeter of the work area, or half the distance to the nearest residential or commercial property, whichever is less, all work activities will be halted.

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

If efforts to abate the emission source are unsuccessful and if organic vapor levels are approaching 5 ppm above background for more than 30 minutes in the 20 Foot Zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect.

However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background, 200 feet downwind or half the distance to the nearest residential/commercial property.

5.0 MAJOR VAPOR EMISSION RESPONSE PLAN

Upon activation, the following activities will be undertaken:

1. All Emergency Response Contacts, as listed in the Health and Safety Plan (Appendix 9 of the RAWP), will go into effect.

2. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation.

3. Frequent air monitoring will be conducted at 30 minutes intervals within the 20 Foot Zone. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Safety Officer.

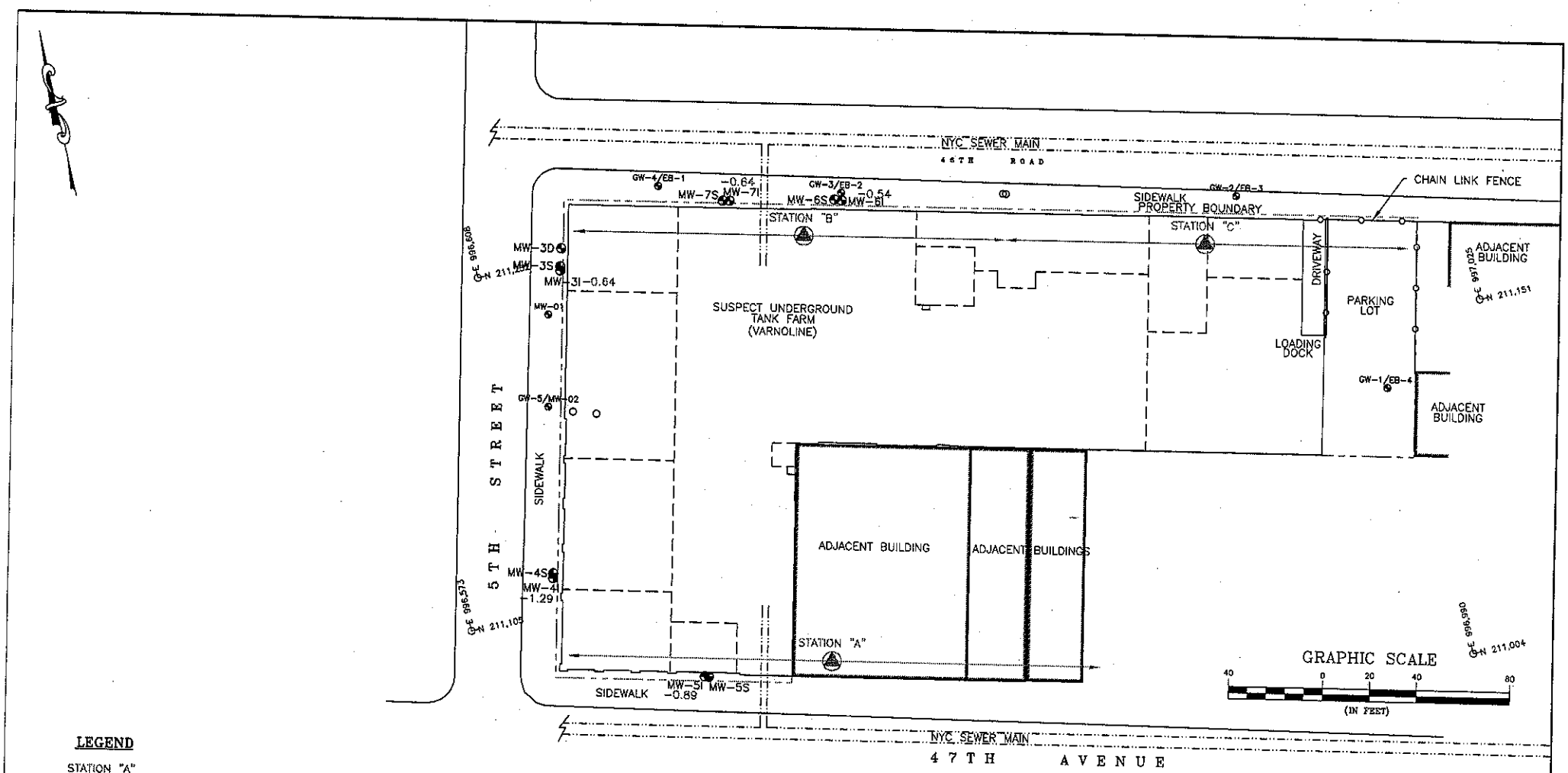
4. In addition, an attempt to identify the point source of the elevated vapor emission will be made. If identified, suppression activities, i.e. containing or covering the source with a vapor impermeable material, will be carried out to minimize the on-going vapor emission event prior to restarting the work activities.

6.0 AIRBORNE PARTICULATE RESPONSE PLAN

If excessive visible dust is observed leaving the work area, then dust suppression methods will be employed. The methods that may be utilized are listed in Section 3.2 above. Work may continue with dust suppression methods as long as no visible dust leaves the work area.

7.0 MAJOR AIRBORNE PARTICULATE RESPONSE PLAN

If the downwind airborne particulate concentration exceeds the background concentration by more than 0.15 mg/m^3, then work will cease and both the work activity and dust suppression techniques re-evaluated to reduce further particulate dispersion. Work will only resume after the downwind airborne particulate concentration is reduced to below 0.15 mg/m^3 against the background level and no visible dust is observed leaving the work area.



LEGEND

STATION "A"

AIR MONITORING STATION

PROPERTY BOUNDARY

BUILDING OUTER WALL

BUILDING INTERIOR WALL/MULTIPLE STORY WALL

SOURCE: "MONITORING WELL LOCATION PLAN", DPK CONSULTING, LLC, MIDDLESEX, NJ – 4/28/08

Environmental Waste Management Associates, LLC
P.O. Box 5430
Parsippany, NJ 07054
Tel: (973) 560-1400

SCALE: AS SHOWN	PROJECT# 205490
DATE: 6/25/08	
DRAWN BY: JM/JS	
CHECKED BY: DD	

COMMUNITY AIR MONITORING STATION LOCATION PLAN

OCA LIC FIFTH STREET MIXED-USE HOUSING
5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

APPENDIX# 2

APPENDIX F – OCA LIC
OM&M PLAN FOR REMEDIATION OF LNAPL IN LOWER SAND UNIT

APPENDIX F – OCA LIC OM&M OUTLINE PLAN FOR REMEDIATION OF LNAPL IN LOWER SAND UNIT

1.0 EQUIPMENT

The equipment that will be used for LNAPL recovery at the Site will be a Spill Buddy®. In addition, secondary protected storage containers will be utilized. The catalog cut sheets and operating manual if appropriate for this equipment will be maintained at the Site for reference during the recovery work.

2.0 HEALTH & SAFETY

Staff performing the recovery work will comply with the provisions of the Site HASP, and the HASP will be maintained at the Site for reference during the recovery work.

3.0 MEASUREMENTS

Twice monthly site visits will be undertaken during the transition period between approval of the RDR and approval of the forthcoming SMP. During each OM&M visit, measurements of water levels and product thicknesses will be obtained in the LNAPL related wells.

4.0 LNAPL RECOVERY

During each twice monthly OM&M visit, if LNAPL is detected in a well at a recoverable thickness, then the LNAPL will be recovered using a Spill Buddy.

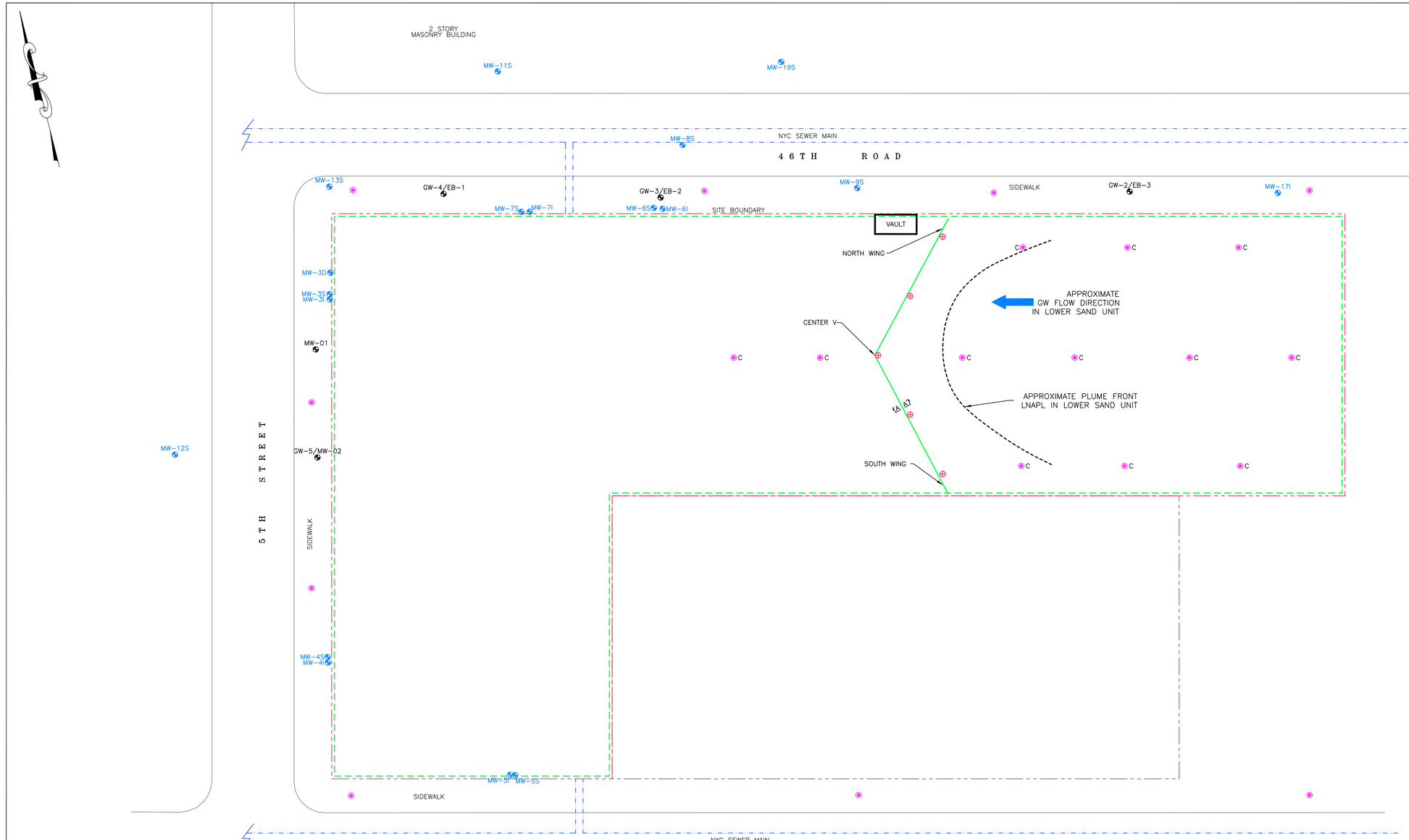
5.0 LNAPL STORAGE, TRANSPORT AND DISPOSAL

Recovered LNAPL and associated liquids will be stored on-site in a storage unit with a secondary protected secure location. Stored liquids will be regularly transported offsite for disposal to a permitted facility under the oversight of a qualified waste manager.

6.0 DOCUMENTATION AND REPORTING

Staff performing the OM&M measurements and recoveries will document the measurements and recovery volumes in a logbook to be maintained at the Site. A qualified waste manager will oversee transport and disposal activities and document these activities. The measurement information and documentation will be correlated and provided to NYSDEC monthly in the form of a letter report with attachments.

APPENDIX G – OCA LIC
FINAL PLANS AND SPECIFICATIONS FOR
REMEDIATION OF LNAPL IN LOWER SAND UNIT



LEGEND

MW-01	J.C. BRODERICK & ASSOCIATES MONITORING WELL LOCATION – 2008
GW-1	EEA, INC. MONITORING WELL LOCATION – 2008
MW-13S	EWMA MONITORING WELL LOCATION (PERCHED WATER ZONE) – 2008/2009
MW-3I	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008/2009 WITH MAXIMUM RECORDED LNAPL THICKNESS (FEET) AS OF MARCH 2009
MW-3D	EWMA MONITORING WELL LOCATION (SAND AQUIFER) – 2008
⊕	RECOVERY WELL LOCATION
◉	LNAPL MONITORING/REMEDIATION WELL
◉C	LNAPL MONITORING/REMEDIATION WELL COUPLET (ONE WELL SCREENED AT TOP OF LOWER SAND UNIT NEXT TO ONE WELL SCREENED AT BOTTOM OF LOWER SAND UNIT)
	SITE BOUNDARY
	CAPTURE WALL ALIGNMENT
	BCP REMEDIAL AREA

GENERAL NOTES:

1. THIS DRAWING LN–1 AND ITS COMPANION DRAWING LN–2 PRESENT SPECIFICATIONS FOR THE INSTALLATION OF A REMEDIAL SYSTEM. THESE TWO DRAWINGS ARE A PART OF THE OCA LIC MAY 2010 REMEDIAL DESIGN REPORT (RDR) FOR REMEDIATION OF LNAPL IN THE LOWER SAND UNIT. FOR CLARITY, BOTH DRAWINGS SHOULD BE READ AND EXAMINED TOGETHER WITH THE MAY 2010 REMEDIAL DESIGN REPORT;
2. INTEGRATION OF THE REMEDIAL SYSTEM WITH PLANNED SITE BUILDINGS IN THE FUTURE MAY REQUIRE THE PERFORMANCE OF STRUCTURAL, MECHANICAL AND ELECTRICAL ENGINEERING ACTIVITIES. THOSE ACTIVITIES SHALL BE UNDERTAKEN BY THE OCA LIC BUILDING DESIGN ENGINEERS. EWMA DOES NOT PROVIDE BUILDING DESIGN SERVICES;
3. THE LOCATIONS OF THE REMEDIAL SYSTEM COMPONENTS DISPLAYED ON DRAWINGS LN–1 AND LN–2 HAVE BEEN ADJUSTED TO CONFORM TO THE PLANNED LOCATIONS OF SITE BUILDINGS (AND BUILDING COMPONENTS). IF THOSE PLANNED LOCATIONS ARE CHANGED, THEN IT MAY BE NECESSARY TO CHANGE THE LOCATIONS OF SOME REMEDIAL SYSTEM COMPONENTS TO CONFORM TO THE CHANGED BUILDING LOCATIONS;
4. INFORMATION UTILIZED IN THE PREPARATION OF DRAWINGS LN–1 AND LN–2 WAS LARGELY PRESENTED IN THE OCA LIC REMEDIAL INVESTIGATION REPORT AND THE OCA LIC REMEDIAL ACTION WORK PLAN. BOTH OF THESE DOCUMENTS ARE THEREFORE SUITABLE BACKGROUND REFERENCES FOR AS NEEDED USE DURING REVIEW OF DRAWINGS LN–1, LN–2 AND THE RD;.
5. THE INSTALLATION OF THE REMEDIAL SYSTEM ADDRESSED IN THESE DRAWINGS IS NOT TO GO OUT FOR GENERAL BID. FOR REASONS OF PROJECT FAMILIARITY AND TIMEFRAMES, IT WILL BE MANAGED BY OCA LIC CONTRACTOR CITISTRUCTURE AND OCA LIC ENVIRONMENTAL CONSULTANT EWMA.

INSTALLATION NOTES:

1. THE OCA LIC REMEDIAL DESIGN REPORT, INCLUDING DRAWINGS LN–1 AND LN–2, IS INTENDED TO PLAN AND SPECIFY THE INSTALLATION OF REMEDIAL UTILITIES TO BE USED FOR THE CONTAINMENT AND REMOVAL OF LNAPL IN THE LOWER SAND UNIT AT THE SITE. THE PLANNED REMEDIAL UTILITIES INCLUDE 38 MONITORING/RECOVERY/REMEDIATION WELLS, AN APPROXIMATE 120–FOOT ALIGNMENT OF AZ 14–700 STEEL SHEET PILES TO FORM AN LNAPL CAPTURE WALL, AND A STORAGE VAULT FOR STORAGE OF RECOVERED FLUIDS IN THE EVENT THAT AUTOMATED FLUID RECOVERY SYSTEMS ARE REQUIRED;
2. THE CAPTURE WALL, STORAGE VAULT, AND 29 OF THE WELLS SHALL BE INSTALLED IN A FORMER REMEDIAL EXCAVATION AREA WHOSE FLOOR HAS BEEN COVERED WITH GEOTECHNICAL FABRIC AND LIFTS OF QUARRY PROCESS STONE FOR STABILITY OF HEAVY EQUIPMENT DURING THE INSTALLATION WORK. ACCESS TO THE REMEDIAL SYSTEM INSTALLATION AREA SHALL BE PROVIDED BY OCA LIC CONTRACTOR CITISTRUCTURE;
3. NINE ADDITIONAL WELLS SHALL BE INSTALLED AROUND THE SITE PERIMETER WITH ACCESS SUPPORT FROM CITISTRUCTURE;
4. INSTALLATION OF THE MONITORING/RECOVERY/REMEDIATION WELLS SHALL BE ONGOING FOR A PERIOD OF SEVERAL WEEKS. DURING THIS TIME, THE CAPTURE WALL AND STORAGE VAULT SHALL ALSO BE INSTALLED;

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)

STEEL SHEET PILE CAPTURE WALL SPECIFICATION

1. GENERAL DESCRIPTION: THE SPECIFIED CAPTURE WALL SHALL BE CONSTRUCTED WITH ASTM A–328 NEW HOT ROLLED AZ 14–700 STEEL SHEET PILES DRIVEN IN AN APPROXIMATE 120–FOOT V–SHAPED ALIGNMENT TO A DEPTH OF 20–FEET BELOW ORIGINAL SITE GROUND SURFACE (BGS). SEAL WELDS OF COMMON INTERLOCKS SHALL BE PROVIDED FOR ALL PAIRS OF SHEETING AND ADEKA P201 SHALL BE PROVIDED IN THE DRIVEN INTERLOCKS;
2. DRIVING CONDITIONS: THE ALIGNMENT LOCATION SHALL BE WITHIN AN AREA THAT HAS BEEN EXCAVATED TO 7–FEET BGS, COVERED WITH MIRAFI 140–NW GEOTECHNICAL FABRIC, AND BACKFILLED UP TO 5–FEET BGS WITH QUARRY PROCESS STONE. THE TYPICAL DEPTH TO TOP OF WATER TABLE IS 7–FEET BGS. WET SILTY SAND FILL WITH CINDERS, BRICK AND CONCRETE RUBBLE EXISTS FROM 7–FEET BGS DOWN TO ABOUT 11–FEET BGS. A PEAT AND CLAY STRATUM EXISTS FROM ABOUT 11–FEET BGS DOWN TO ABOUT 13–FEET BGS. A STRATUM OF MEDIUM TO FINE SAND WITH ORGANIC SILT, AND SILT CONTENT TYPICALLY RANGING FROM ABOUT 15 TO 50 PERCENT EXISTS FROM ABOUT 13–FEET BGS DOWN TO ABOUT 25–FEET BGS. THE DOMINANT N–VALUES OF THE ABOVE–DESCRIBED SOIL MATERIALS RANGE FROM ABOUT 2 TO 10;
3. REMEDIATION SITE DATUM: HORIZONTAL DATUM FOR PURPOSES OF THE RDWP AND THESE DRAWINGS SHALL BE THE SITE PROPERTY BOUNDARIES AS DISPLAYED ON THE DRAWINGS. THE VERTICAL DATUM SHALL BE THE SITE REMEDIAL ELEVATION DATUM WITH ELEV. +0.00' ROUGHLY EQUIVALENT TO ORIGINAL TOP OF SITE GROUND SURFACE. THE HORIZONTAL AND VERTICAL DATUMS SHALL BE USED TO CONFIRM CAPTURE WALL INSTALLATION LOCATIONS AND ELEVATIONS IN THE FIELD AS IS ACCEPTABLE TO THE REMEDIATION ENGINEER;
4. HORIZONTAL ALIGNMENT: THE HORIZONTAL ALIGNMENT OF THE CAPTURE WALL SHALL BE AS DISPLAYED ON DRAWING LN–2. THE HORIZONTAL ALIGNMENT SHALL BE V–SHAPED WITH A TOTAL LENGTH OF ABOUT 120–FEET, LOCATED AS SHOWN AND DIMENSIONED ON LN–2, WITH ENDS OF NORTH AND SOUTH WINGS FIELD FIT CLOSELY ADJACENT TO AND WITHIN 6–INCHES OF EXISTING SHORING AT THE END OF EACH WING. HOWEVER, THE HORIZONTAL ALIGNMENT SHALL ALSO BE FIELD FIT TO THE EXISTING CONDITIONS AS IS ACCEPTABLE TO THE REMEDIATION ENGINEER;
5. VERTICAL ALIGNMENT: THE VERTICAL ALIGNMENT AND COMPLETION ELEVATIONS OF THE CAPTURE WALL SHALL BE AS DISPLAYED ON DRAWING LN–2. VERTICAL ALIGNMENT SHALL BE WITH TOP OF WALL CUT TO 6–FEET BGS AND BOTTOM OF WALL AT 20–FEET BGS. HOWEVER, THE VERTICAL ALIGNMENT SHALL ALSO BE FIELD FIT TO THE EXISTING CONDITIONS AS IS ACCEPTABLE TO THE REMEDIATION ENGINEER;
6. MEANS AND METHODS: MEANS AND METHODS ARE THE CONTRACTOR'S RESPONSIBILITY, INCLUDING BUT NOT LIMITED TO MATERIAL OFFLOADING, HANDLING AND STORAGE, COMPLIANCE WITH NOISE ORDINANCES, SELECTION AND USE OF HANDLING AND DRIVING TOOLS AND EQUIPMENT, SELECTION AND USE OF ALIGNMENT TOOLS AND FRAMES, HEALTH AND SAFETY COMPLIANCE INCLUDING COMPLIANCE WITH THE SITE SPECIFIC HEALTH AND SAFETY PLAN, COMPLIANCE WITH ROAD USE AND TRANSPORTATION RULES, PROVISION OF QUALIFIED SUPERVISORY AND LABOR PERSONNEL, AND INSTALLATION OF THE SPECIFIED CAPTURE WALL IN CONFORMANCE WITH THESE SPECIFICATIONS;
7. DRIVING REQUIREMENTS: THE AZ 14–700 STEEL SHEET PILES SHALL BE DRIVEN TRUE, STRAIGHT AND UNDAMAGED AND SHALL BE INSTALLED IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THESE SPECIFICATIONS. THE SHEET PILES MAY BE DRIVEN SINGLY OR IN PAIRS, AND SHALL BE DRIVEN IN SUCH A MANNER AS TO INSURE PERFECT INTERLOCKING THROUGHOUT THE ENTIRE LENGTH OF EACH PILE. THE SHEET PILES SHALL BE HELD PLUMB AND TRUE AND IN PROPER ALIGNMENT DURING DRIVING BY MEANS OF ASSEMBLING FRAMES OR OTHER SUITABLE GUIDE STRUCTURES. IF PILES ARE FOUND TO BE OUT OF ALIGNMENT DURING THE DRIVING, THEN THE PILES SHALL BE PULLED BACK AS NEEDED TO BE RE–DRIVEN FOR CORRECT ALIGNMENT. ANY SHEET PILE RUPTURED IN THE INTERLOCK OR OTHERWISE DAMAGED AT DELIVERY OR DURING INSTALLATION SHALL BE REMOVED AND REPLACED;
8. DRIVING SEQUENCE: THE DRIVING SEQUENCE SHALL BE IN CONFORMANCE WITH STANDARD PRACTICES WITH TONGUE OR BALL END ALWAYS LEADING. THE VERTICAL OFFSET BETWEEN ADJACENT SHEET PILES SHALL BE NO MORE THAN ABOUT 5–FEET AT ANY TIME DURING THE INSTALLATION WORK;
9. COMPLETION DETAILS: EACH DRIVEN SHEET PILE SHALL BE ONE COMPLETE CONTINUOUS SHEET PILE AS MANUFACTURED, WITH NO WELDED SECTIONS AND NO SPLICED SECT1ONS. INTERLOCK DEFLECTIONS WILL BE ALLOWED AT THE END OF EACH WING AS NEEDED TO PROVIDE A CAPTURE WALL CLOSE FIT TO WITHIN 6–INCHES OF EXISTING SHORING SYSTEMS;
10. SHOP DRAWINGS: THE SHEET PILE INSTALLATION CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO THE REMEDIATION ENGINEER FOR REVIEW AND APPROVAL PRIOR TO START OF THE SHEET PILE INSTALLATION WORK. THE SHOP DRAWINGS SHALL PRESENT THE CONTRACTOR'S PLANNED SIZE AND TYPE OF DRIVING EQUIPMENT, SIZE AND TYPE OF ALIGNMENT FRAMES OR GUIDES, SHEET PILE INSTALLATION SEQUENCE, AND FABRICATION DETAILS FOR THE V SECTION WHERE THE NORTH AND SOUTH WINGS OF THE CAPTURE WALL WILL JOIN, IN THE FORM OF DRAWING NOTES, PLAN VIEWS AND/OR DETAILS;
11. ACCESS AND OBSTRUCTIONS: OCA CONTRACTOR CITISTRUCTURES SHALL PROVIDE AND MAINTAIN ACCESS TO THE CAPTURE WALL INSTALLATION AREA, AND SHALL REMOVE OBSTRUCTIONS AS NEEDED AND AS MAY BE ENCOUNTERED DURING THE INSTALLATION OF THE CAPTURE WALL;
12. TOLERANCES: THE MAXIMUM ACCEPTABLE DEVIATION OF EACH SHEET PILE IN X–AXIS AND Y–AXIS FROM VERTICAL SHALL BE 1–INCH IN 5–FEET. THE MAXIMUM ACCEPTABLE HORIZONTAL DEVIATION FROM THE DESIGN ALIGNMENT AT EXISTING GROUND SURFACE LEVEL SHALL BE 6–INCHES. SHEET PILES SHALL BE PERFECTLY INTERLOCKED THROUGHOUT THE ENTIRE LENGTH OF EACH PILE. IN THE EVENT OF ANY DAMAGE THE DAMAGED SHEET SHALL BE PULLED AND REPLACED. IN THE EVENT OF ANY APPARENT INTERLOCK MISALIGNMENT, THE REMEDIATION ENGINEER SHALL BE NOTIFIED AND WILL INSPECT THE INTERLOCK AND WILL DECIDE WHETHER OR NOT THE GIVEN SHEET SHALL BE LEFT IN PLACE OR PULLED AND REPLACED;
13. DOCUMENTATION: THE SHEET PILE INSTALLATION CONTRACTOR SHALL MAINTAIN DRIVING RECORDS INCLUDING DRIVING TIMES, SEQUENCES AND LOCATIONS AND SHALL PROVIDE THESE RECORDS TO THE REMEDIATION ENGINEER UPON COMPLETION OF THE INSTALLATION WORK FOR REVIEW AND APPROVAL.

NYS Engineering Note:
It is a violation of Article 145 Section 7209(2) of New York State Education Law for any person, unless he is acting under the direction of a New York State licensed engineer, to alter an item of this document in any way. If an item is altered, the altering engineer shall affix to the item his seal and the notation "altered by" followed by his signature and the date of such alteration, and a specific description of the alteration.

EWMA ENGINEERING SERVICES, LLL – NYS ENG. CERT # 0005216

RICHARD ARNOLD
NYS PE # 076202

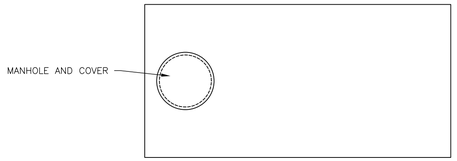
REVISIONS		
No./ID	DATE	

An Environmental Consulting & Remediation Firm
100 Misty Lane
P.O. Box 5430
Parsippany, NJ 07054

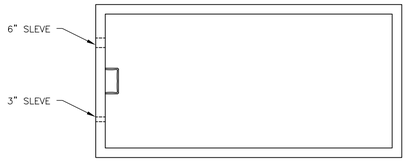
SCALE: AS SHOWN
DATE: 5/20/10
PROJECT# 205490
DRAWN BY: RR
CHECKED BY: RA
FILE: k:\drawings\205490\2010 MAY\205490-LN1.dwg

SITE LOCATION MAP FOR REMEDIATION OF LNAPL IN LOWER SAND UNIT
OCA LIC FIFTH STREET MIXED–USE HOUSING
5–20 46TH ROAD
LONG ISLAND CITY, NEW YORK

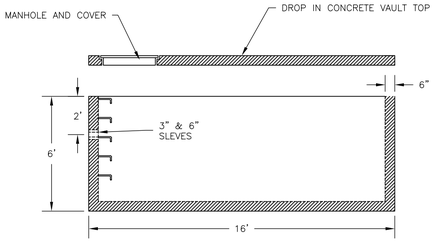
FIGURE# LN–1



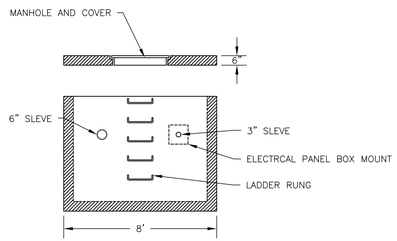
DROP IN CONCRETE VAULT TOP TOP VIEW
SCALE: 1" = 4'



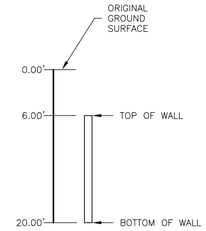
CONCRETE VAULT TOP VIEW
SCALE: 1" = 4'



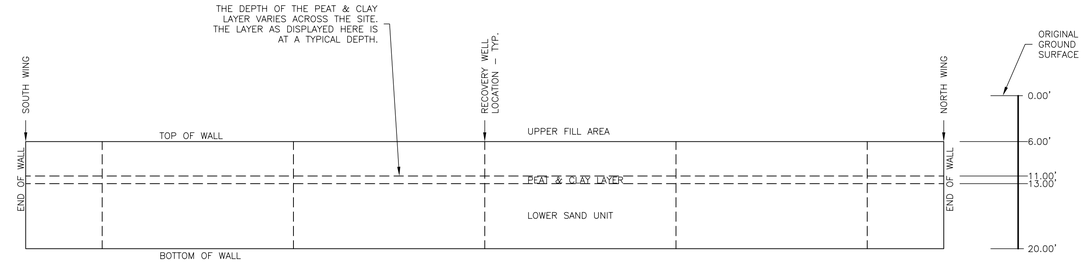
CONCRETE VAULT SIDE VIEW
SCALE: 1" = 4'



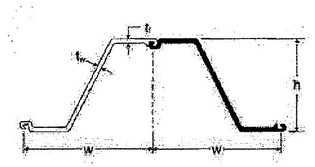
CONCRETE VAULT FRONT VIEW
SCALE: 1" = 4'



SECTION OF CAPTURE WALL
SCALE: 1" = 10'



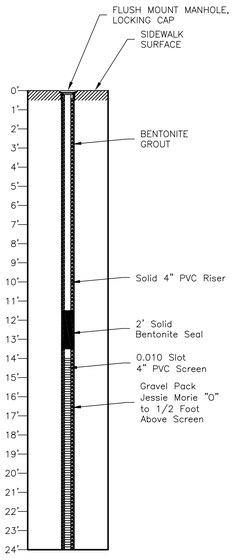
PROFILE OF CAPTURE WALL ALLIGNMENT
SCALE: 1" = 10'



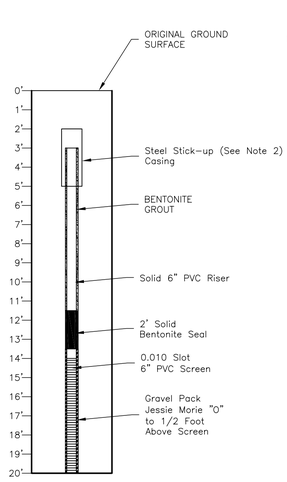
SECTION	WIDTH (W) in (mm)	HEIGHT (H) in (mm)	THICKNESS FLANGE (t_f) in (mm)	THICKNESS WEB (t_w) in (mm)	CROSS SECTIONAL AREA in²/ft (cm²/m)	WEIGHT PILE lb/ft (kg/m)	WEIGHT WALL lb/ft (kg/m²)	SECION MODULUS in³/ft (cm³/m)	MOMENT OF INERTIA in⁴/ft (cm⁴/m)	COATING AREA BOTH SIDES ft²/ft OF SINGLE (m²/m)	COATING AREA WALL SURFACE ft²/ft² OF WALL (m/m²)
AZ 12	26.38 (670)	11.89 (302.0)	0.335 (8.50)	0.335 (8.50)	5.94 (125.7)	44.42 (66.10)	20.22 (98.70)	22.3 (1200)	132.8 (18140)	5.45 (1.66)	1.23 (1.23)
AZ 13	26.38 (670)	11.93 (303.0)	0.375 (9.50)	0.375 (9.50)	6.47 (136.9)	48.38 (72.00)	22.02 (107.50)	24.2 (1300)	144.3 (19700)	5.45 (1.66)	1.23 (1.23)
(AZ 14)	26.38 (670)	11.97 (304.0)	0.413 (10.50)	0.413 (10.50)	7.03 (148.9)	52.62 (78.30)	23.94 (116.90)	26.0 (1400)	156.0 (21300)	5.45 (1.66)	1.23 (1.23)

VERTICAL AND HORIZONTAL DATUM

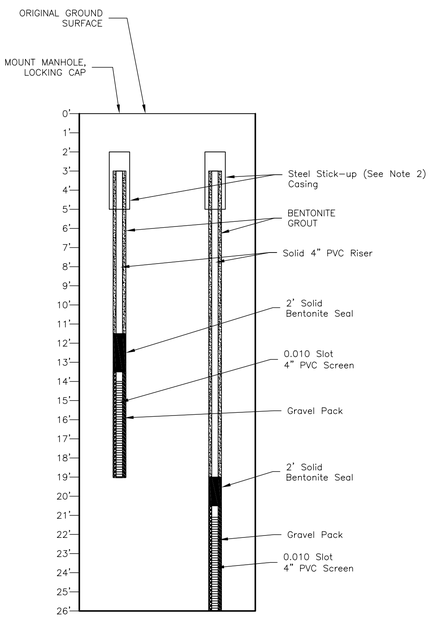
1. HORIZONTAL DATUM: FOR THE PURPOSES OF THIS PROJECT, TO PROVIDE EASE IN LOCATION CONFIRMATION DURING SITE WORK, THE LOCATIONS PRESENTED ON DRAWINGS LN-1 AND LN-2 ARE TO SCALE AND ARE TO BE VERIFIED IN THE FIELD BY TAPED MEASUREMENTS FROM THE SHORING SYSTEM THAT IS LOCATED DIRECTLY ALONG THE SITE PROPERTY LINE ON ALL SIDES OF THE BCP SITE AREA;
2. VERTICAL DATUM: FOR THE PURPOSES OF THIS PROJECT, TO TIE VERTICAL INSTALLATION WORK DIRECTLY INTO THE INVESTIGATION FINDINGS AND TO PROVIDE DIRECT CORRELATION OF VERTICAL LOCATIONS WITH RESPECT TO THE COMPLETED EXCAVATION FLOOR, ORIGINAL GROUND SURFACE REFERENCES ON DRAWINGS LN-1 AND LN-2 ARE SET AT 0.00'. THEREFORE, ACTUAL DEPTHS BELOW ORIGINAL GROUND SURFACE ARE USED FOR RECORD MEASUREMENTS OF TOP AND BOTTOM OF PEAT & CLAY LAYER DURING WELL INSTALLATIONS AND FOR USE IN SETTING SCREEN DEPTHS AND CAPTURE WALL DRIVE DEPTHS;



PERIMETER MONITORING/REMEDIATION WELL
SCALE: 1" = 4'



CAPTURE WALL MONITORING/RECOVERY WELL
SCALE: 1" = 4'



MONITORING/REMEDIATION WELL COUPLET
SCALE: 1" = 4'

MONITORING/REMEDIATION/RECOVERY WELL SPECIFICATION

1. WELL INSTALLATION METHODS: EACH WELL SHALL BE INSTALLED WITH AUGER DRILLING METHODS, IN A BOREHOLE WITH A 2-INCH ANNULAR SPACE BETWEEN OUTER SURFACE OF WELL SCREEN OR RISER MATERIAL AND INNER SURFACE OF THE WELL BORE. THE WELLS SHALL BE INSTALLED PLUMB AND TRUE AND IN ACCORDANCE WITH NYS REGULATIONS AND GOOD AUGER DRILLING PRACTICES AND WELL INSTALLATION PRACTICES THAT ARE WELL ACCEPTED IN THE DRILLING INDUSTRY;
2. WELL COMPLETION METHODS: EACH WELL WITHIN THE INTERIOR OF THE SITE SHALL BE FINAL COMPLETED AT THE TIME OF INSTALLATION WITH A STEEL PIPE STICK-UP COMPLETION AND LOCKAGE WELL CAP. EACH PERIMETER WELL SHALL BE FINAL COMPLETED WITH A FLUSH MOUNT WELL SUMP THAT SHALL BE INSTALLED FLUSH WITH THE FINAL DEVELOPED PAVEMENT SURFACE AT EACH GIVEN LOCATION. AT THE TIME OF DEVELOPMENT CONSTRUCTION, EACH INTERIOR WELL SHALL BE RE-WORKED FOR FINAL COMPLETION WITH A FLUSH MOUNT WELL SUMP THAT SHALL BE INSTALLED FLUSH WITH THE FINAL DEVELOPED PAVEMENT SURFACE AT EACH GIVEN LOCATION. THE FLUSH MOUNT WELL SUMPS SHALL BE 8-INCH DIAMETER TRAFFIC RATED SUMPS WITH O-RING SEALABLE AND LOCKABLE CAST IRON COVERS.
3. VERIFICATION OF EFFECTIVENESS: UPON COMPLETION, EACH WELL SHALL BE CAREFULLY MEASURED TO VERIFY INSTALLED DIMENSIONS, SHALL BE THOROUGHLY DEVELOPED BY PUMPING AND ALSO BY SURGE BLOCK METHODS IF REQUIRED IN ACCORDANCE WITH GOOD WELL DEVELOPMENT PRACTICES UNTIL TURBIDITY LEVELS ARE MINIMIZED AND WITHIN SUITABLE LIMITS. AT CESSATION OF PUMPING, THE RECOVERY RATE IN EACH WELL SHALL BE MEASURED TO VERIFY FUNCTIONALITY AND ADDITIONAL DEVELOPMENT SHALL BE PERFORMED IF NEEDED;
4. CONFIRMATION OF SCREEN DEPTH: DURING AUGER ADVANCEMENT, STANDARD SPLIT SPOONS SHALL BE ADVANCED IN ACCORDANCE WITH GOOD DRILLING PRACTICES AND SAMPLES OBTAINED FOR FIELD EXAMINATION TO IDENTIFY THE ACTUAL BOTTOM OF PEAT & CLAY LAYER AND BOTTOM OF LOWER SAND UNIT AT EACH WELL LOCATION. SCREEN DEPTHS AND SPECIFIC WELL CONSTRUCTION DETAIL FOR EACH WELL SHALL THEN BE BASED UPON THIS FIELD FINDING;
5. PERIMETER MONITORING/REMEDIATION WELLS (9): THESE WELLS SHALL BE 4-INCH DIAMETER PVC MONITORING AND REMEDIATION WELLS, INSTALLED WITH BLANK RISER PIPE, 0-MORIE GRAVEL PACKS, AND 10-SLOT SCREENS. THE WELL SCREENS SHALL BE INSTALLED FROM NEAR BOTTOM OF THE LOWER SAND UNIT (ASSUMED TO BE ABOUT 24-FEET BGS), UP TO ½-FOOT BELOW BOTTOM OF PEAT & CLAY LAYER. BLANK RISER PIPE SHALL BE INSTALLED FROM TOP OF SCREEN UP INTO EACH WELL SUMP. GRAVEL PACKS SHALL BE INSTALLED IN THE ANNULAR SPACE AROUND EACH SCREEN FROM BOTTOM OF SCREEN UP TO BOTTOM OF PEAT & CLAY LAYER. A SOLID 2-FOOT THICK BENTONITE SEAL SHALL BE INSTALLED FROM ABOVE THE TOP OF GRAVEL PACK AND UP THROUGH THE PEAT & CLAY LAYER. AN EXPANSIVE BENTONITE GROUT SHALL THEN BE INSTALLED FROM ABOVE THE TOP OF SOLID BENTONITE SEAL AND UP TO BOTTOM OF FLUSH MOUNT WELL SUMP.
6. CAPTURE WALL MONITORING/RECOVERY WELLS (5): THESE WELLS SHALL BE 6-INCH DIAMETER PVC MONITORING AND RECOVERY WELLS, INSTALLED WITH BLANK RISER PIPE, 0-MORIE GRAVEL PACKS AND 10-SLOT SCREENS. THE WELL SCREENS SHALL BE INSTALLED FROM BOTTOM OF CAPTURE WALL (20-FEET BGS) UP TO ½-FOOT BELOW BOTTOM OF PEAT & CLAY LAYER. BLANK RISER PIPE SHALL BE INSTALLED FROM TOP OF SCREEN UP TO ABOUT 3-FEET BGS. GRAVEL PACKS SHALL BE INSTALLED IN THE ANNULAR SPACE AROUND EACH SCREEN FROM BOTTOM OF SCREEN UP TO BOTTOM OF PEAT & CLAY LAYER. A SOLID 2-FOOT THICK BENTONITE SEAL SHALL BE INSTALLED FROM ABOVE THE TOP OF GRAVEL PACK AND UP THROUGH THE PEAT & CLAY LAYER. AN EXPANSIVE BENTONITE GROUT SHALL THEN BE INSTALLED FROM ABOVE THE TOP OF SOLID BENTONITE SEAL AND UP TO THE WELL COMPLETION THAT SHALL INITIALLY BE A STEEL PIPE STICK-UP COMPLETION WITH LOCKABLE WELL CAP.
7. MONITORING/REMEDIATION WELL COUPLETS (12): TWO COUPLETS SHALL BE INSTALLED DOWN-GRADIENT OF THE CAPTURE WALL AND TEN COUPLETS SHALL BE INSTALLED UPGRADIENT OF THE CAPTURE WALL AS SHOWN ON DRAWING LN-1. EACH COUPLET SHALL CONSIST OF AN UPPER WELL AND A LOWER WELL INSTALLED AT A HORIZONTAL DISTANCE OF ABOUT 5-FEET FROM EACH OTHER. UPPER AND LOWER WELLS SHALL BE 4-INCH DIAMETER PVC MONITORING/REMEDIATION WELLS INSTALLED WITH BLANK RISER PIPE, 0-MORRIE GRAVEL PACKS AND 10-SLOT SCREENS. THE UPPER WELLS SHALL TYPICALLY BE INSTALLED WITH 5-FEET OF WELL SCREEN EXTENDING FROM ½-FOOT BENEATH THE BOTTOM OF PEAT & CLAY LAYER AND DOWN INTO THE LOWER SAND UNIT. BLANK RISER PIPE SHALL BE INSTALLED FROM TOP OF SCREEN UP TO EACH WELL COMPLETION AT ABOUT 3-FEET BGS. GRAVEL PACKS SHALL BE INSTALLED IN THE ANNULAR SPACE AROUND EACH WELL SCREEN FROM BOTTOM OF SCREEN UP TO BOTTOM OF PEAT & CLAY LAYER. A 2-FOOT THICK SOLID BENTONITE SEAL SHALL BE INSTALLED ABOVE THE GRAVEL PACK THROUGH THE PEAT & CLAY LAYER. AN EXPANSIVE BENTONITE GROUT SHALL THEN BE INSTALLED FROM ABOVE THE TOP OF SOLID BENTONITE SEAL AND UP TO THE WELL COMPLETION THAT SHALL INITIALLY BE A STEEL PIPE STICK-UP COMPLETION WITH LOCKABLE WELL CAP. THE LOWER WELLS SHALL TYPICALLY BE INSTALLED WITH 5-FEET OF WELL SCREEN EXTENDING FROM NEAR BOTTOM OF LOWER SAND UNIT AND UP INTO THE UNIT. BLANK RISER PIPE SHALL BE INSTALLED FROM TOP OF SCREEN UP TO EACH WELL COMPLETION AT ABOUT 3-FEET BGS. GRAVEL PACKS SHALL BE INSTALLED IN THE ANNULAR SPACE AROUND EACH WELL SCREEN FROM BOTTOM OF SCREEN UP TO ABOUT ½-FOOT FOOT ABOVE TOP OF SCREEN. A 2-FOOT THICK SOLID BENTONITE SEAL SHALL BE INSTALLED ABOVE THE GRAVEL PACK AND THROUGH A SILTY PORTION OF THE LOWER SAND UNIT. AN EXPANSIVE BENTONITE GROUT SHALL THEN BE INSTALLED FROM ABOVE THE TOP OF SOLID BENTONITE SEAL AND UP TO THE WELL COMPLETION THAT SHALL INITIALLY BE A STEEL PIPE STICK-UP COMPLETION WITH LOCKABLE WELL CAP.

STORAGE VAULT "SPECIFICATION"

1. BUILDING DESIGN: THIS STORAGE VAULT "SPECIFICATION" IS PROVIDED AS GENERAL INFORMATION FOR REVIEW AND FINALIZATION BY THE OCA LIC BUILDING DESIGNERS, BECAUSE THE VAULT WILL TIE IN OR BE PROXIMAL TO STRUCTURAL FLOOR AND/OR STRUCTURAL MEMBERS OF THE COMPLETED BUILDING, BECAUSE THE VAULT ITSELF IS STRUCTURAL, AND BECAUSE IT WILL HOUSE ELECTRICAL AND OTHER UTILITIES AND MAY BE USED FOR STORAGE OF FLAMMABLE MATERIALS;
2. PURPOSE OF THE VAULT: THE STORAGE VAULT IS ASSUMED TO BE PRE-CAST AND IS PROVIDED AS A CONTINGENCY FEATURE. BASED ON THE RESULTS OF A 3-MONTH LNAPL REMOVAL PROGRAM USING PORTABLE SKIMMING EQUIPMENT, OTHERS MAY DECIDE IN THE FUTURE THAT AUTOMATED PRODUCT RECOVERY IS NEEDED AT THE SITE. IF SO, THE STORAGE VAULT IS INTENDED TO HOUSE A PRODUCT STORAGE TANK THAT WILL RECEIVE RECOVERED OILY WATER;
3. VAULT ACCESSORIES: TO FULFILL ITS FUNCTION IF NEEDED, THE VAULT SHALL BE FITTED WITH A 6-INCH DIAMETER SLEEVE THAT RUNS FROM THE VAULT TO AN ACCESS SUMP ADJACENT TO THE RECOVERY WELL AT THE CAPTURE WALL V. THIS SLEEVE SHALL BE CAPABLE OF HOUSING POWER, PNEUMATIC, CONTROL, AND CONVEYANCE UTILITIES THAT MAY RUN BETWEEN THE VAULT AND THE RECOVERY WELL TO SUPPORT POTENTIAL FUTURE IN-WELL AUTOMATED SKIMMING OPERATIONS. IN ADDITION, THE VAULT SHALL BE FITTED WITH A 3-INCH SLEEVE THAT SHALL BE ENGINEERED TO HOUSE A 2-INCH TANK VENT PIPE IF NEEDED. IF NEEDED IN THE FUTURE, A 4-INCH SLEEVE SHALL BE RETRO-FITTED TO HOUSE A VENTILATION BLOWER EXHAUST PIPE;
4. VAULT COVER: THE VAULT COVER SHALL BE TRAFFIC RATED AND SHALL BE REMOVABLE BY LIFT EQUIPMENT WITHIN THE FUTURE PARKING GARAGE AREA. IT SHALL BE FITTED WITH A 36-INCH DIAMETER CIRCULAR MANWAY WITH TRAFFIC RATED COVER AT ONE END TO PROVIDE PERSONNEL ACCESS TO THE VAULT;
5. INSTALLATION: THE VAULT SHALL BE INSTALLED AT THE LOCATION SHOWN ON LN-1 WITH GENERAL AS-BUILT DIMENSIONS AS ILLUSTRATED ON LN-2. HOWEVER, IT SHALL BE FIELD FIT TO INSTALLATION AND AS-BUILT DIMENSIONS AS ARE ACCEPTABLE TO THE REMEDIATION ENGINEER. IT SHALL BE SET DURING INSTALLATION WITH TOP OF TRAFFIC RATED COVER AT 0.0-FEET BGS. IT SHOULD BE NOTED THAT THE PLANNED INSTALLATION LOCATION IS EXTERIOR TO THE PLANNED BUILDING BOUNDARY AND IS WITHIN THE PROPERTY LIMITS.

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DETAIL PLAN

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5-20 46TH ROAD
LONG ISLAND CITY, NEW YORK

FIGURE# LN-2