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BT Red Hook, LLC

INTERIM REMEDIAL MEASURE DESIGN WORK PLAN - RED HOOK 3

Site No. C224213

68 and 100 Ferris Street/242 and 300 Coffey Street

Brooklyn, New York

December 2019

Certification

I, Terry W. Young, PE, certify that I am currently a New York State registered professional engineer and that this *Interim Remedial Measure Design Work Plan – Red Hook 3* was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER *Technical Guidance for Site Investigation and Remediation* (DER-10).

_____ Date _____

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Site No. C224213
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, New York

Prepared for:

BT Red Hook, LLC

Prepared by:

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017

Our Ref.:

B0038993.0002

Date:

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CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ABOx	anaerobic biological oxidation
AESI	Atlantic Environmental Solutions, Inc.
AMSL	above mean sea level
Arcadis	Arcadis of New York, Inc.
ASTM	ASTM International
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
BFS	blast furnace slag
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAMP	Community Air Monitoring Plan
CERP	Community Environmental Response Plan
cm/sec	centimeters/second
COPC	constituents of potential concern
DER	Division of Environmental Remediation
DWP	Design Work Plan
DNAPL	dense non-aqueous-phase liquid
ft	feet
ft/ft	feet per foot
gpm	gallons per minute
HHEA	Human Health Exposure Assessment
IRM	Interim Remedial Measure
ISS	in-situ solidification
NAPL	non-aqueous phase liquid
NSZD	natural source zone depletion
NYCDEP	New York City Department of Environmental Protection
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
PAH	polycyclic aromatic hydrocarbons

PC	Portland cement
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RH3	Red Hook 3
RH4	Red Hook 4
RI	Remedial Investigation
SCG	standards, criteria, and guidance
SCOs	Soil Cleanup Objectives
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SRB	sulfate reducing bacteria
SRI	Supplemental Remedial Investigation
SRIWP	Supplemental Remedial Investigation Work Plan
SVOC	semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
UCS	unconfined compressive strength
VOC	volatile organic compounds

1 INTRODUCTION

This *Interim Remedial Measure Design Work Plan* (IRM DWP) has been prepared for the Red Hook 3 (RH3) Brownfield Site (New York State Department of Environmental Conservation [NYSDEC] Brownfield Site No. C224213), hereafter referred to as the "RH3 Site" or simply "RH3," located at 68 and 100 Ferris Street/242 and 300 Coffey Street in Brooklyn, New York (**Figures 1** and **2A,** the latter including block and lot boundaries). The RH3 Site is subject to a Brownfield Cleanup Agreement among Red Hook Industrial Center, LLC (the most recent previous site owner and Volunteer in the Brownfield Cleanup Program [BCP]); BT Red Hook, LLC (site owner as of December 19, 2018); and NYSDEC. RH3 was entered into the BCP in August 2015 via an agreement between Red Hook 212, LLC (owner prior to Red Hook Industrial Center, LLC); and NYSDEC.

This IRM DWP has been prepared by Arcadis of New York, Inc. (Arcadis) on behalf of BT Red Hook, LLC, in accordance applicable provisions of the NYSDEC's Division of Environmental Remediation (DER) *Technical Guidance for Site Investigation and Remediation* (DER-10; NYSDEC 2010). Additionally, this IRM DWP includes revisions to address NYSDEC comments (letter dated November 26, 2019) to the Arcadis IRM DWP draft submittal of October 2019.

This IRM DWP presents the basis for and a description of the components proposed to represent the remedy for the RH3 Site, and identifies the anticipated remedial design content for the Excavation IRM component of the proposed remedy. As identified in previous documents for this Site (Arcadis 2018b and Arcadis 2019a), based on discussions with NYSDEC mobile non-aqueous phase liquid (NAPL; source material) is the main driver for remediation and the impacts deeper than 15 feet below ground surface (bgs) can typically be managed in-situ (15 feet is the depth used to determine the appropriate land use category for a site; 6NYCRR Part 375-1.8(g)(6)(iii)). The overall remedial goal for the Site is to meet the requirements of the BCA and obtain the Certificate of Completion so that this land can be revitalized.

At this time, property redevelopment plans are in progress for the RH3 Site, as well as the adjacent Red Hook 4 (RH4) Brownfield site (No. C224214) (**Figure 2B**). As discussed with NYSDEC, during a March 1, 2019 meeting at NYSDEC's Albany office between representatives from NYSDEC, New York State Department of Health (NYSDOH), BT Red Hook, LLC and Arcadis, in light of the redevelopment, a dense NAPL (DNAPL) excavation Interim Remedial Measure (IRM) is proposed as a significant component of the remedy for the RH3 Site. Based on NYSDEC's August 27, 2019 comment letter and other considerations, a more aggressive Excavation IRM than proposed in earlier versions of the Draft RH3 IRM DWP is presented herein, and it includes removal of additional DNAPL locations and in-situ treatment.

As discussed during the September 9, 2019 meeting the more aggressive RH3 IRM was developed to achieve the following: 1) address NYSDEC comments; 2) facilitate timely approval to support initiation of the public comment period for the IRM in December 2019, while avoiding project delays; and 3) meet BT Red Hook, LLC's redevelopment schedule which includes completing the ongoing RH4 Excavation IRM (substantial completion estimated for December 2019) and then initiating the RH3 IRM beginning in January 2020. The proposed IRM described herein would address the DNAPL (source) areas and would be implemented in conjunction with a site-wide ground surface cover (i.e., Engineering Control [EC]), Institutional Controls (ICs) and a Site Management Plan (SMP) to address remaining impacts.

Collectively, the proposed remedial components provide a comprehensive BCP Track 4 remedy for the RH3 Site that is fully protective of human health and the environment. A Track 4 remedy, as defined in Title 6 of New York Codes, Rules and Regulations (6 NYCRR) Part 375-3.8(e)(4) and detailed in NYSDEC Policy CP-51 *Soil Cleanup Guidance* (CP-51; NYSDEC 2010b), includes site-specific clean-up objectives or approaches for soil and may include the use of long-term institutional or engineering controls to address all media. Additionally, the proposed remedial components detailed herein are consistent with current and anticipated future zoning for the commercial/industrial nature of the property, which allows for manufacturing and certain commercial uses.

A Remedial Investigation (RI) and Supplemental Remedial Investigation (SRI) for the RH3 Site were conducted to delineate the nature and extent of impacts and assess the associated potential impacts to human health and the environment. Additionally, a qualitative Human Health Exposure Assessment (HHEA) was conducted. The RI, HHEA, and SRI work and the associated results and assessments, are detailed in the following:

- *Remedial Investigation Report – Red Hook 3* prepared by Atlantic Environmental Solutions, Inc. (AESI), dated October 31, 2017 (AESI 2017a).
- *Human Health Exposure Assessment – Red Hook 3* prepared by Arcadis, dated October 2018 (Arcadis 2018a), and approved by NYSDEC in a letter dated March 19, 2019.
- *Supplemental Remedial Investigation Report – Red Hook 3 Revised* prepared by Arcadis, dated March 2019 (Arcadis 2019a), and approved by NYSDEC in a letter dated April 5, 2019.

As detailed in the SRI Report, the nature and extent of site-related impacts to the environment have been adequately characterized to fulfill the applicable requirements of the BCA. Based on the findings of the SRI and the HHEA, no imminent threat to human health or the environment has been identified.

Based on the results of the SRI and HHEA, and the discussions and meetings between BT Red Hook, LLC, the NYSDEC, and Arcadis, an Excavation IRM to address DNAPL through removal and in-situ treatment is proposed. The basis for and a description of the proposed IRM activities, in conjunction with a site-wide ground surface cover (e.g., one-foot clean soil cover, building, pavement), ICs, and SMP to provide a comprehensive Track 4 BCP remedy for the RH3 Site, are provided in the following sections of this IRM DWP.

1.1 IRM DWP Organization

Table 1 - Report Organization

Section	Description
Section 1 – Introduction	Presents relevant background information, including a summary of Site impacts.
Section 2 – Site Remedy Basis	Presents the basis for the comprehensive Site remedy proposed in this IRM DWP.
Section 3 – Proposed Site Remedy	Presents a description of the proposed Site remedy, including results of the pre-design confirmation soil boring program implemented in

Section	Description
	2019, after completion of the SRI, to confirm the absence/presence of NAPL-saturated source material along the originally proposed IRM excavation limits and provide a basis for the revised proposed limits identified herein. These limits were discussed during the September 9, 2019 meeting among representatives from NYSDEC, BT Red Hook, LLC, and Arcadis.
Section 4 – Excavation IRM Permits and Approvals	Identifies the anticipated permit equivalencies, permits and approvals necessary to implement the Excavation IRM.
Section 5 – Excavation IRM Design Submittals and Schedule	Identifies the remedial design documents to be prepared in support of the Excavation IRM and presents the anticipated project schedule for completing the Excavation IRM and implementing the Site remedy.
Section 6 – References	Presents a list of documents used to support preparation of this IRM DWP.

1.2 Background

This section summarizes Site background information relevant to the development and evaluation of remedial alternatives, including Site description, Site history, and RI/SRI conclusions. Details are presented in the RI and SRI Reports.

1.2.1 Site Description

The RH3 Site is an approximately 9.1-acre paved, irregularly L-shaped parcel located within a mixed industrial, commercial, and residential area in an urban setting (**Figure 1**). The RH3 Site is zoned for manufacturing as M2-1, which allows manufacturing and certain commercial uses. RH3 consists of four adjoining parcels (**Figures 2A** and **2B**) bounded to the northeast by Wolcott Street (approximately 750-foot frontage) with NYSDEC Brownfield Site C224214 beyond (RH4 Site); to the southeast by Ferris Street (approximately 250-foot frontage) with NYSDEC Brownfield Site C224256 across Ferris Street (145-65 Wolcott Street Site); to the south and southwest by Dikeman Street; and to the west and northwest by Buttermilk Channel (approximately 900-foot frontage). Three buildings were or are currently located on RH3 (building demolition underway as part of property redevelopment by BT Red Hook, LLC), as follows:

Historical map circa 1780 superimposed over current topography showing Red Hook 3 and adjoining Red Hook 4 boundaries of historical low water line.

- A vacant, three-story, brick warehouse, constructed circa 1920 and occupying a footprint of approximately 100,000 square feet.
- A vacant, single-story, metal-sided warehouse constructed circa 1995 and occupying approximately 50,000 square feet.

- A vacant single-story, masonry-sided building, formerly occupied by U.S. government offices (United States Bureau of Alcohol, Tobacco, Firearms and Explosives and United States Drug Enforcement Administration), occupying approximately 37,000 square feet.

Areas not occupied by buildings are covered with impervious surfaces including pavement, concrete, or asphalt. A steel retaining wall is located along the bulkhead along Buttermilk Channel. Elevation across the RH3 Site ranges from approximately 8 feet above mean sea level (AMSL) at the extreme eastern corner near the intersection of Ferris and Wolcott Streets, to 11 feet AMSL along the retaining wall at the western/northwestern boundary along Buttermilk Channel. Portions of the RH3 Site where buildings do not front the street are enclosed by a fence with locking gates.

1.2.2 Site History

The RH3 Site has a long history of commercial and industrial development dating to the late 1800s. Historical documentation indicates that the property now occupied by RH3 was below the mean water line in the late 1700s/early 1800s and was subsequently filled. Prior uses include fertilizer and chemical manufacturing, tar manufacturing, tar and resin storage, shipyard/repair, and newspaper production. Historical uses of adjoining and surrounding properties include oil refining, lumber and grain storage, dry-dock and boat repair, and manufacture and storage of lubricating oils.

1.2.3 Previous Investigations

Numerous investigations have been conducted by others at RH3, the findings of which are summarized in the following documents:

- Phase I Environmental Site Assessment (ESA), 68 Ferris Street, Brooklyn, NY (Roux Associates, Inc., November 2007)
- Phase I ESA, 212 Wolcott Street, Brooklyn, NY (Roux Associates, Inc., November 2007)
- Phase II ESA, 212 Wolcott Street/68 Ferris Street, Brooklyn, NY (Langan Engineering and Environmental Services, Inc., P.C., April 2012)
- Preliminary Geotechnical Review, 212 Wolcott Street (aka 68 Ferris Street, Brooklyn, NY – “The Project”) (Langan Engineering and Environmental Services, Inc., P.C., April 2012)
- Phase I ESA, 212 Wolcott Street and 68 Ferris Street, Brooklyn, NY (Langan Engineering and Environmental Services, Inc., P.C., May 2012)
- Phase I ESA, 242/300 Coffey Street, Brooklyn, NY (Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. [Langan], April 2015)

- Limited Phase II Environmental Site Investigation, 242/300 Coffey Street, Brooklyn, NY (Langan, May 2015)
- Remedial Investigation Report, Red Hook 3, 68 Ferris Street (Block 573, Lot 100), 100 Ferris Street (Block 573, Lot 1), 242-300 Coffey Street (Block 595, Lot 70), NYSDEC BCP Site C224213 (AESI 2017b)

1.2.4 RI/SRI Conclusions

This section presents the findings and conclusions presented in the RI and SRI Reports. **Figure 3** shows the soil boring and monitoring well locations.

1.2.4.1 Local Geology/Hydrogeology

RH3 is in the Red Hook section of Brooklyn at an elevation of approximately 8 to 11 feet AMSL. This section of Brooklyn is in an area that was historically below the water line and is currently underlain by fill (sand, silt, gravel, concrete, and asphalt) that extends to approximately 10 to 15 feet bgs.

Bedrock was not encountered in borings advanced to a maximum depth of 80 feet bgs by Arcadis in 2017 and 2018 or AESI in 2017. Borings advanced by Arcadis in 2017 and 2018 penetrated a surficial layer of fill sitewide across RH3. A discontinuous layer of sand, silt and gravel underlain by a soft deposit of interbedded clayey silt and fine sand was encountered along portions of the site adjacent to Buttermilk Channel and to a lesser extent along Wolcott Street. A dense silt and clay were found below these layers in similar regions of RH3 but was not present within the central and southern portion of the site. Underlying these units is a thick deposit of predominantly sand with trace amounts of silt and gravel. In the southern portion of the site this sand unit typically becomes siltier.

Data from borings installed by Arcadis and others were used to construct geologic cross sections provided in the SRI Report. The cross-section location map showing three cross-section transects in plan view and the associated cross-section maps are presented in **Appendix A**.

The water table beneath RH3 occurs at approximately 4.5 to 11 feet bgs and is tidally influenced. Gauging data from well pairs with the deeper wells screened below the silt/clay layer indicate a potentiometric surface approximately 0.5 to 1 foot lower than the adjacent, shallow-screened wells suggesting a downward hydraulic gradient.

Groundwater contour maps presented in the SRI Report (copies provided in **Appendix A**) show a dynamic pattern with apparent flow direction reversals, as would be expected in a tidally influenced environment. The measured hydraulic gradient ranges from approximately 0.0029 to 0.0073 feet per foot (ft/ft) in deep-screened wells and 0.0047 to 0.05 ft/ft in shallow-screened wells.

There are no groundwater supply wells located at or in the vicinity of the RH3 Site. New York City's drinking water is supplied from reservoirs located in upstate New York.

1.2.4.2 Conceptual Site Model

As presented in the NYSDEC-approved SRI Report (Arcadis 2019a), the SRI is the culmination of numerous subsurface investigations conducted at RH3 over the past six years and effectively addressed

the following principal data gaps: 1) defining the vertical and horizontal extent of DNAPL, which is the main driver for remediation; and 2) collecting information to support the remedial alternatives review required under the BCA. After completing the SRI 2018, a pre-design confirmation soil boring program was completed in 2019 pursuant to NYSDEC's request (Section 3.1.1).

As shown on **Figures 4** and 5, DNAPL impacts are generally concentrated beneath and proximate to the former metal warehouse location. Based on data generated by AESI (2017b) and Arcadis, concentrations of NAPL-related constituents in groundwater are generally limited to the DNAPL-impacted zone.

Field and analytical data indicate that DNAPL resembling petroleum tar is present at depths of 7 to 25 feet bgs beneath the eastern and southeastern portions of RH3 and extends beneath Wolcott Street (**Figures 4** and **5**). Impacts in Wolcott Street (beyond the RH3 Site boundary) are found at depths of 11 to 20 feet bgs and have a similar chemical signature as the deeper impacts on RH4. Additionally, as discussed during the September 9, 2019 meeting at NYSDEC's Albany office, further forensic analysis of the data obtained during the SRI indicate differences in the distribution of biomarkers suggesting the RH3 DNAPL is different that the RH4 DNAPL.

Although DNAPL impacts in Wolcott Street (between RH3 and RH4) are shallower than the impacts on RH4, a defined horizontal or vertical conduit or pathway from RH3 and Wolcott Street to RH4 was not identified based on the results of the extensive subsurface investigation activities conducted on RH3 (by Arcadis and others). The investigation activities were conducted over a period of more than seven years and included sampling 22 monitoring wells, drilling/characterizing 114 soil borings prior to and during the SRI, and drilling/characterizing 75 soil borings post-SRI to confirm DNAPL extent and obtain waste characterization data required for off-site treatment/disposal purposes.

Groundwater data (AESI 2017b and Arcadis 2018; see groundwater analytical figures in the AESI Remedial Investigation Report dated October 2017 and included in **Appendix A**), combined with minimal DNAPL thickness in monitoring wells (MW-1, LMW-2) suggest minimal DNAPL mobility.

As detailed in the SRI Report (Arcadis 2019a), seven synoptic monitoring well gauging events were conducted by Arcadis at the RH3 Site between April 2018 and September 2018. During that period, measurable DNAPL (maximum thickness 0.12 ft) was identified in two of the 22 monitoring wells: 0.1 ft DNAPL in MW-1 on June 1, 2018; and 0.05 ft to 0.12 feet in LMW-2 on September 10 and 11, 2018. Since completing the SRI, Arcadis conducted two additional synoptic monitoring well gauging events (February 7, 2019 and March 27, 2019) during which no measurable NAPL was identified in any of the 22 monitoring wells.

1.2.4.3 Human Health Exposure Assessment

The NYSDEC-approved HHEA (Arcadis 2018a) presents a qualitative exposure assessment characterizing the exposure setting, evaluates fate and transport pathways, and identifies potentially complete exposure pathways. NYSDEC's approval was provided in letter to Arcadis dated March 19, 2019 (NYSDEC 2019). Conclusions presented in the HHEA are summarized below.

- Metals and PAHs at concentrations exceeding SCOs are common in the historical fill on RH3 that extends to approximately 10 to 15 feet bgs (i.e., from ground surface to approximately 10 feet below the water table). Urban fill similar to that placed at the RH3 Site is ubiquitous throughout Brooklyn and elsewhere in New York City.

- Under current conditions, there is no complete exposure pathway to surface soil because the RH3 Site is covered with impervious surfaces (i.e., buildings, pavement, concrete, and asphalt).
- Future construction and/or utility workers may be exposed to impacted soil and/or groundwater. If construction or utility workers engage in intrusive activities whereby an impervious surface covering RH3 is removed, potential exposures would likely be mitigated through the use of appropriate health and safety measures. These additional measures have been successfully implemented at numerous sites throughout New York State.
- Groundwater is not used as a potable resource at the RH3 Site under current conditions and is not anticipated to be used under future conditions.
- Based on a current commercial use scenario at the GSO building and the uncertainty associated with the 2017 indoor air and soil gas data sets provided in the Remedial Investigation Report (AESI 2017b), additional evaluation was recommended in the HHEA to assess the potential for exposure to chemicals of potential concern in indoor air from a subsurface source.
- Under a future use scenario, if buildings are constructed, it is recommended that potential vapor mitigation strategies be evaluated.

2 SITE REMEDY BASIS

This section presents the basis for the components proposed to represent the comprehensive remedy for the RH3 Site, and includes the Remedial Action Objectives (RAOs). Meeting the RAOs is part of a NYSDEC threshold criterion (overall protectiveness of public health and the environment) for remedy selection (NYSDEC 2010a).

2.1 Remedial Action Objectives

The RAOs presented in the following table have been identified for the RH3 Site through consideration of the results presented in the SRI Report and are consistent with the generic RAOs listed on NYSDEC's website (http://www.dec.ny.gov/regulations/67560.html).

Table 2 - Remedial Action Objectives

RAOs for Soil
1. Prevent ingestion/direct contact with contaminated soil. 2. Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil. 3. Prevent migration of contaminants that would result in groundwater or surface water contamination.
RAOs for Groundwater
1. Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards. 2. Prevent contact with, or inhalation of volatiles, from contaminated groundwater. 3. Restore the groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable. 4. Remove the source of groundwater or surface water contamination.
RAO for Soil Vapor
1. Mitigate impacts to public health resulting from the potential for soil vapor intrusion into future buildings at a site.

The RAOs, in combination with results of the NYSDEC-approved HHEA (Arcadis 2018a) and the extensive subsurface investigation activities conducted at RH3 over the past seven years, have been used to identify the following aspects of the RH3 Site that form the basis for the proposed remedy presented in this IRM DWP. These aspects need to be addressed for the RH3 Site remedy to be comprehensive and fully protective of human health and the environment:

- DNAPL source material (**Figure 5**). As previously identified, based on discussions with NYSDEC and as identified in the SRI Report, Arcadis understands that free-phase DNAPL (source material) is the main driver for remediation and that impacts deeper than 15 feet bgs can typically be managed in-

situ. As shown on **Figure 5**, DNAPL impacts are generally concentrated beneath and proximate to the former metal warehouse location. No recoverable NAPL has been identified in any of the RH3 monitoring wells.

- Exceedances of NYSDEC unrestricted use SCOs (6 NYCRR Part 375; and NYSDEC 2010b) outside of the DNAPL areas.
- Although future groundwater usage is not anticipated, groundwater use limitations (as set forth in an Environmental Easement) will be required for this Site. As detailed in the SRI Report, the concentrations of NAPL-related constituents in groundwater are generally limited to the DNAPL areas (see groundwater analytical figures in the AESI Remedial Investigation Report dated October 2017 and included in **Appendix A)**. Dissolved phase groundwater impacts will be minimized by addressing DNAPL source material, and the soluble constituents of NAPL (e.g., benzene, toluene, ethylbenzene, xylenes [BTEX] and naphthalene) are amenable to natural decay processes that will be enhanced by in-situ treatment (Section 3.2). No additional remedial action for groundwater is required.
- Construction and utility workers may be exposed to groundwater and/or soil during intrusive activities. Additional health and safety measures are required to reduce the potential for future construction and utility workers exposure to impacted materials and these measures have been successfully implemented at numerous sites throughout New York State.
- Potential for volatiles in the subsurface to migrate into indoor air via vapor intrusion should a building be constructed at the Site. Some VOC analytes were identified in the HHEA as constituents of potential concern (COPC) in groundwater based on comparison to risk-based levels protective of indoor air exposure by future building occupants. Accordingly, the following was identified in the HHEA: should a future building be constructed at the Site, an evaluation of potential vapor mitigation strategies is recommended. As discussed during the March 1, 2019 meeting at NYSDEC's Albany office (among representatives from NYSDEC, NYSDOH, BT Red Hook, LLC and Arcadis), BT Red Hook, LLC will incorporate vapor intrusion mitigation measures in the redevelopment plans for the property.

As noted above, addressing these aspects of the RH3 Site form the basis for the proposed remedy presented in this IRM DWP. Under the terms and conditions of the BCA, BT Red Hook, LLC is not responsible for the remediation of off-site contamination because it is a Volunteer (as defined in 6 NYCRR Part 375-3.2). As Volunteer, BT Red Hook, LLC is responsible to take reasonable steps to control reasonably accessible off-site migration of any contamination. NAPL was observed during the RH3 SRI activities at two off-site investigation locations (**Figure 4**). The remediation (DNAPL source) areas for the RH3 Site are identified in the following section, followed by a discussion of the revised proposed Site remedy components. Site remedy components have been developed based on their ability to meet the RAOs and effectively address Site-specific aspects (identified above) to provide overall protectiveness of public health and the environment.

2.2 Remediation Areas

As identified above, remediation is required to address DNAPL source areas. As shown on **Figure 5**, DNAPL impacts are generally concentrated beneath and proximate to the former metal warehouse location. Based on the results of the SRI and prior investigation activities and discussions with NYSDEC and

NYSDOH (including a March 1, 2019 meeting at NYSDEC's Albany office), two remediation areas (**Figure 5**) were proposed in the March 2019 Draft IRM DWP to address DNAPL source areas to 15 feet bgs (depth used to determine the appropriate land use category for a site; 6NYCRR Part 375-1.8(g)(6)(iii)), pending results of the pre-design confirmation soil boring program to confirm excavation limits (Section 3.1.1). These areas encompassed all the on-site locations where DNAPL was observed in soil, during or prior to the SRI completed in 2018, at 15 feet bgs or shallower, except for the following:

- Visible NAPL was observed in soil boring A-RH3-B13 (located on the west side of Dikeman Street, across from the former metal warehouse), where NAPL was only observed at 14.5 ft bgs. NAPL was not observed in the proximate borings, including co-located boring A-RB-DB2.
- Visible NAPL was observed at three locations near the GSO Building (**Figure 4**) and these areas were identified as potential excavation areas during discussions with NYSDEC that occurred prior to and during the SRI. These were "potential" areas because the existing data were inconclusive regarding the presence of visible NAPL. Data obtained subsequent to completing the SRI demonstrates that remediation is not required, as discussed most recently with NYSDEC during an April 25, 2019 meeting with Arcadis and summarized below:
    - As part of the recent waste characterization sampling required for off-site treatment/disposal of soil, two soil borings were drilled in each of the potential excavation areas at locations proximate to the inconclusive SRI observations regarding the presence of NAPL. No NAPL was observed in these four waste characterization soil borings.
    - Measurable DNAPL has not been identified in monitoring well LMW-2 since completing the SRI; and during the SRI, minimal DNAPL was identified only on September 10 and 11, 2018. Since completing the SRI, Arcadis has conducted two additional synoptic monitoring well gauging events (February 7, 2019 and March 27, 2019) during which no measurable NAPL was identified in any of the 22 monitoring wells, including LMW-2 (see Section 1.2.4.2 for additional details).

  NYSDEC agreed during the April 25, 2019 meeting that these locations near the GSO Building are not source areas and therefore remediation is not required.

2.3 Identification of Site Remedy Components

Site remedy components were identified based on their ability to meet the RAOs and be implemented in a time frame supportive of rapid property redevelopment. To facilitate identification of appropriate remedy components, an in-situ solidification (ISS) bench-scale treatability test was conducted as described in the *Supplemental Remedial Investigation Work Plan – Red Hook 3 (SRIWP)*, submitted by Arcadis on July 11, 2018 (Arcadis 2018b) and approved by NYSDEC on July 26, 2018. ISS is well-established remediation technology that typically involves in-situ mixing of pozzolanic and/or cementitious materials with (into) impacted soil to form a low-permeability solid monolith, thereby reducing NAPL mobility and leaching potential to surrounding groundwater.

Provided in the section below is a description of the ISS treatability study and associated results and conclusions, followed by a description of the proposed remedial components for the RH3 Site.

2.3.1 ISS Treatability Study

2.3.1.1 ISS Treatability Study Description

Arcadis conducted a bench-scale treatability test to facilitate a timely evaluation of ISS to address soils impacted with DNAPL at the RH3 Site. The treatability testing was conducted at the Arcadis Treatability Laboratory in Durham, North Carolina (Treatability Laboratory). ISS of NAPL impacted soils collected from the RH3 Site during the SRI were evaluated and optimized through the addition ground-granulated blast furnace slag (BFS) and/or Portland cement (PC). The addition of pozzolanic admixtures will result in strength gain and hydraulic conductivity reduction within the solidified soil, thus reducing the mobility of DNAPL and limiting leaching potential to surrounding groundwater.

To understand the ability of ISS to achieve the specified goals under varying soil types with visible NAPL, soil from three borings were collected during the RH3 SRI for use in the treatability study. Discrete five-foot intervals from each boring were individually packaged into plastic Ziploc bags and containerized within plastic five-gallon buckets with screw-top lids for shipment to the Treatability Laboratory. Individual containers of site potable water for RH3 (consistent with the water source that would be used during full-scale ISS implementation) were also collected and utilized for the treatability study.

Upon receipt at the Treatability Laboratory, the discrete intervals from each boring were weighed and qualitatively assessed by Treatability Laboratory staff for geotechnical characteristics and degree of NAPL impacts. Following initial characterization, selected individual bagged samples were composited together to create a composite sample.

Soil samples used to create the RH3 composite sample were first screened using a 3/8” sieve to remove oversize material. The composite sample was homogenized within a 12-gallon plastic bucket by mixing with a ½-inch drive steel mixing auger mounted to an electric variable speed drill. From the soil homogenate, a one-gallon plastic bucket was filled to be submitted for baseline geotechnical characterization. Duplicate moisture content samples were also processed in-house for the composite samples using the gravimetric oven-drying method. Baseline geotechnical characterization of the composite sample was performed by Geotechnics, Inc. in Raleigh, NC.

A total of six ISS test mixes for the RH3 composite sample were investigated in this bench scale study, each with unique admixture addition rates. Test mixes included either PC only, or a combination of PC and BFS. Regionally available Type I/II PC and BFS (NewCem) were obtained from LaFarge North America. Admixtures and their respective addition rates were selected based upon the assessment of the degree of NAPL present within the soils, geotechnical characterization results, as well as Arcadis’ previous experience with ISS at other DNAPL-impacted sites.

Admixture addition rates were based on soil dry mass and added to each mix as a dry powder, immediately followed by Site potable water. Potable mixing water additions were based on slump performance (described below). Each mix was then thoroughly homogenized in a stainless-steel mixing bowl using a Hobart Model HL-200 planetary mixer.

Final mix workability was quantitatively determined through slump testing. During slump determination, the test mix is loaded into an inverted cone, and the slump is measured as the difference between the initial sample height and final sample height after the cone is gently removed.

A miniature slump cone test, derived from ASTM International (ASTM) Method C143-00, was used to measure the slump of each mix, as a standard slump cone is not feasible for laboratory scale studies due to a large sample volume requirement. A miniature slump cone has a height of 150 millimeters (mm), a bottom diameter of 100 mm, and a top diameter of 75 mm. This miniature slump measurement was then converted to a standard slump measurement using the following equation, as determined by Malusis et al. (2008):

$S_S = 60 + 1.8S_M$,

S_S = Standard Slump

S_M = Miniature Slump

Based upon Arcadis' previous experience with ISS technology, a standard slump measurement of 4 to 7 inches was targeted as representing a workable mix. Following slump testing, the mixes were transferred to a series 2-inch by 4-inch plastic geotechnical molds. Molds were tapped continuously during filling to preclude the entrainment of air bubbles within the cured sample. Filled molds were cured in a humid environment inside large airtight Ziploc bags at ambient room temperature until further processing.

At seven days of curing, Geotechnics tested one mold from each mix for unconfined compressive strength (UCS) by ASTM D1633. At 28 days of curing, Geotechnics performed UCS testing on each mix in duplicate. Following the review of UCS testing results, two mixes for RH3 DNAPL were selected from the 6 available mixes for hydraulic conductivity analysis by ASTM D5084. When selecting two mixes for hydraulic conductivity testing, Arcadis considered technical performance in comparison to the defined characteristics of treated soil and economic considerations associated with the dosage rate of the admixtures.

2.3.1.2 ISS Treatability Study Conclusions

The RH3 composite soil sample was assessed by Treatability Laboratory staff to have noticeable hydrocarbon odor. Within certain discrete intervals of each location, visible NAPL was observed coating soil particles.

The composite was classified as "Silty Sand". Loss on ignition and testing indicated 99.3% ash content and 0.7% organic matter. Water content (17.7%) and specific gravity (2.76) were also measured for the composite. Atterberg limits testing was not possible on the composite, as the soil was classified as "non-plastic material".

Test mixes had standard slump values within a range of 4.49 to 5.13 inches, representing workable mixes as identified above. Results of geotechnical performance testing (UCS and hydraulic conductivity) demonstrated that all test mixes developed strength exceeding the 30 psi target (Arcadis 2018b) at seven days of curing. At 28 days of curing, mixes containing a combination of PC and BFS showed greater strength than those containing PC only at identical total cement addition rates. This is attributed to the slower hydration and greater cement paste density of blended cement when compared with PC alone.

Based on the results of UCS testing, two mixes were selected for hydraulic conductivity analysis by ASTM D5084. Each of the mixes tested for hydraulic conductivity met the hydraulic conductivity goal identified in the SRIWP of 1.0×10^{-6} centimeters/second (cm/sec) maximum.

Based on these findings, Arcadis expects that a mix design of 3% Type I/II Portland cement plus 3% ground-granulated blast furnace slag cement by soil dry weight would achieve the minimum strength (30

psi) and maximum hydraulic conductivity ($1.0x10^{-6}$ cm/sec) goals in site soils based on the two composite soil types investigated during this bench scale treatability study. No significant improvements in hydraulic conductivity performance were associated with higher addition rates of cementitious admixtures in the soil samples tested.

2.3.1.3 Evaluation of ISS as a RH3 Remedial Component

ISS is an established remedial technology to reduce the mobility of NAPL and limit leaching to surrounding groundwater. The results of the ISS bench-scale treatability test indicate that the key performance goals of UCS and hydraulic conductivity could be achieved for the DNAPL at RH3.

As a containment technology, ISS is considered less favorable than removal and/or treatment based on NYSDEC's hierarchy of preference for addressing identifiable sources of contamination (NYSDEC 2010a). Although excavation of the DNAPL source areas is complicated by a number of factors, including the presence of shallow groundwater, it is feasible and would meet the NYSDEC preferred remedial approach of removal. Additionally, excavation can be implemented in a timely manner which is favorable to property redevelopment. Accordingly, ISS is eliminated from further consideration for RH3.

2.3.2 Proposed Remedial Components

Proposed remedial components for the RH3 Site are summarized in the following table. These remedial components, when combined, provide a Site remedy that is fully protective of human health and the environment.

Table 3 – Proposed Site Remedy Components

General Response Action	Technology Type	Technology Process Option
Institutional Controls	Institutional Controls	Deed restriction or environmental easement for RH3 to limit exposure, restrict the use of groundwater, and govern future uses of the land, including procedures for excavating soils and removing groundwater
In-Situ Containment/Control	Site Cover	Existing and/or new ground surface cover consisting of structures (buildings, pavement, sidewalk, etc.) or 1-foot thick cover of soil that meets applicable NYSDEC SCOs
Removal	Excavation	Physical removal of DNAPL source material areas

General Response Action	Technology Type	Technology Process Option
In-Situ Treatment	Engineered Anaerobic Biological Oxidation (ABOx)	ABOx (enhanced biodegradation) through subsurface emplacement of gypsum to provide a long-term source of sulfate to facilitate the ongoing ABOx of petroleum tar-related impacts
Off-Site Management, Treatment or Disposal of Generated Materials	Off-Site Disposal; Thermal Treatment/Destruction; Recycling; Energy Recovery	Solid waste or hazardous waste landfills; low temperature thermal desorption; fuel blending; recycled use of materials (e.g., metal), incineration; use as supplemental fuel source at approved energy recovery facilities

The remedial technologies were combined into a proposed Site remedy that comprehensively achieves the best balance of the NYSDEC remedy evaluation criteria set forth in 6 NYCRR 375-1.8(f), which including the following two threshold criteria: 1) overall protectiveness of public health and the environment; and 2) compliance with applicable standards, criteria and guidance (SCGs). These threshold criteria are satisfied by the proposed Site remedy described in the following section.

3 PROPOSED SITE REMEDY

This section presents a general description of the remedy proposed to be implemented for the RH3 Site. As noted in Section 1, based on discussions and meetings between BT Red Hook, LLC, the NYSDEC, and Arcadis a DNAPL Excavation IRM is proposed to address DNAPL source areas through removal and in-situ treatment. The IRM will be implemented in conjunction with engineering/institutional controls to constitute a comprehensive Site remedy.

3.1 Proposed IRM

The proposed DNAPL Excavation IRM is described below, followed by a description of the additional Site remedy components.

3.1.1 Pre-Design Confirmation Soil Borings

To confirm the proposed original March 2019 IRM excavation limits shown on **Figure 5**, a pre-design confirmation soil borings program was completed, pursuant to NYSDEC's request (letter dated May 24, 2019; copy provided in **Appendix B**). The objective of the program was to confirm the absence/presence of NAPL-saturated source material along the proposed IRM excavation limits.

As discussed during the July 2, 2019 conference call among representatives from NYSDEC, NYSDOH, and Arcadis, excavation horizontal limits were confirmed based on visual observations made from borings (confirmation and previously drilled borings) . The terminal depth for the confirmation soil borings was 30 feet bgs, which was 10 to 15 feet deeper than the March 2019 proposed excavation depths per NYSDEC's request (NYSDEC April 29, 2019 email; copy provided in **Appendix B**).

Drilling for the pre-design confirmation soil boring program was completed on May 23, 2019 and the surveyed locations are shown on **Figure 5**. As shown on the figure, step-out confirmation soil borings from the originally proposed excavation limits were drilled, as necessary, based on observations of DNAPL-saturated source material. A detailed description of the pre-design confirmation soil borings program, including soil boring and photograph logs, was presented in an Arcadis letter to NYSDEC dated June 28, 2019 (copy provided in Appendix B). The conclusions of the program were discussed during a July 2, 2019 conference call among representatives from NYSDEC, NYSDOH, and Arcadis. Subsequent additional communications occurred between NYSDEC and Arcadis, prior to submittal of the July 2019 version of the Draft RH3 IRM DWP to NYSDEC.

In a letter dated August 27, 2019 (**Appendix B**), NYSDEC provided comments in response to conversations with Arcadis regarding the proposed excavation limits and the July 2019 Draft RH3 IRM DWP. NYSDEC's comment letter identified 12 locations that would remain "un-remediated" based on the excavation limits in the July 9, 2019 Draft RH3 IRM DWP and specifies that these locations "*will require long term monitoring and possible additional remedial action (in addition to institutional controls*)". These locations are identified on **Figures 5** and **6** (yellow highlights). Each of the locations is deeper than 15 feet below ground surface, which is the depth used to determine the appropriate land use category for a site (6NYCRR Part 375-1.8(g)(6)(iii)). Based on the NYSDEC's comments, the results of a September 9, 2019 meeting with NYSDEC in Albany to discuss a proposed, revised remedy, and communications

subsequent to the meeting, the proposed components of the RH3 Excavation IRM, described below, include DNAPL excavation and in-situ treatment.

3.1.2 DNAPL Excavations

The proposed DNAPL excavation areas are beneath and proximate to the former metal warehouse location and the excavation depths vary from 15 feet bgs to 24 feet bgs, as shown on **Figure 6.** As noted on the figure (Note 6), the proposed excavation depths are below original grade at the time of or prior to the SRI completed in 2018. The total estimated volume to be excavated is approximately 7,000 cubic yards.

The excavations will require support systems and the associated NYC Department of Buildings (NYCDOB) Permits. Because the water table beneath RH3 occurs at approximately 5 to 11 feet bgs, excavation dewatering will also be required, including an on-site water treatment system for treatment and discharge of water generated during excavation activities. Treated water will be discharged to surface water (Buttermilk Channel) under a State Pollutant Discharge Elimination System (SPDES) permit equivalent. Excavated materials will be direct loaded for off-site treatment/disposal at an approved facility, to the extent possible, using the results of the waste characterization sampling program to be completed in the near-term.

During excavation and material handling activities, odor and dust control methods will be employed. Long-duration foam spray and/or other vapor/odor control measures will be used to suppress odors and volatile organic vapors originating from excavation areas and excavated materials, as needed. The project specific, NYSDEC-approved Community Air Monitoring Plan (CAMP; Arcadis 2019b) will be followed throughout implementation of these activities to document and address (as needed) airborne particulate levels, volatile organic vapor concentrations, and odors resulting implementation of the IRM.

Excavated areas will be backfilled with appropriate fill that meets DER-10 requirements and is suitable for property redevelopment.

An IRM Design Submittal for the DNAPL excavations and in-situ treatment (Section 3.2) will be prepared consistent with the requirements set-forth in the BCA, DER-10, and 6 NYCRR Part 375. As further detailed in Section 5, this will include (but not be limited to) the following documents:

- A set of engineering design drawings and technical specifications that represent an accurate identification of existing Site conditions and an illustration of the proposed work.
- A Health and Safety Plan (HASP) prepared in accordance with the most recently adopted and applicable general industry (29 CFR 1910) and construction (29 CFR 1926) standards of the federal Occupation Safety and Health Administration (OSHA), as well as other federal, state or local applicable statues or regulations.

3.1.2.1 Excavation IRM Preparation Activities

Excavation IRM preparation activities will include (but are not limited to) the following:

- Complete decommissioning of monitoring wells (**Figure 3**), in accordance with NYSDEC's guidance CP-43 *Groundwater Monitoring Well Decommissioning Policy* (NYSDEC 2009). These wells were

decommissioned in May 2019, as documented in the Arcadis Well Decommissioning Report dated August 30, 2019 (**Appendix B**).

- Obtain additional waste characterization data (if necessary) and secure approvals for off-site treatment/disposal of excavated material.
- Perform utility mark-out, protection and relocation within and proximate to the IRM excavation areas.

3.1.2.2 Excavation IRM Implementation Activities

The Excavation IRM implementation will include (but is not limited to) the activities briefly described below, with full implementation details to be addressed in the remedial design.

- Set-up and permit a temporary water treatment system for on-site treatment and discharge of water generated during excavation activities. As identified previously, the excavations will generally extend more than 10 feet into the water table, requiring excavation support systems and dewatering. Preliminary calculations for the estimated excavation dewatering (pumping) rates range from 50 to 250 gallons per minute (gpm). The variability of the pumping rate is dependent on a number of considerations, including the areal extent and depth of excavation, as well as the type of excavation support system. The estimated dewatering rate will be determined during the remedial design.
- Obtain water quality data (as necessary) to permit the temporary on-site treatment system that will discharge treated water generated during excavation activities. Water will be treated to meet the requirements for discharge to surface water (Buttermilk Channel) under a SPDES permit equivalent.
- Install excavation support systems.
- Excavate the DNAPL source areas, located proximate to and beneath the former metal warehouse location (**Figure 6**).
- Excavated materials destined for off-site treatment/disposal will be direct-loaded for off-site treatment/disposal, to the extent possible. Excavated materials that cannot be direct loaded will stockpiled and managed in an onsite temporary containment area, in accordance with the remedial design, until transported off-site for treatment/disposal.
- Dewater and/or amend excavated materials with an appropriate soil drying agent (e.g., Portland cement), as needed, to remove free liquids prior to transporting the materials off site for treatment/disposal.
- Employ odor and dust control methods during the excavation. Long-duration foam spray and/or other vapor/odor control measures will be used to suppress odors and volatile organic vapors originating from the excavation and the excavated materials, as needed. The CAMP (Arcadis 2019b) will be followed during the Excavation IRM to document and address (as needed) the airborne particulate levels, volatile organic vapor concentrations, and odors resulting from implementation of the IRM.
- Implement a decontamination program during the Excavation IRM in accordance with the remedial design, which will set forth the following: 1) decontamination procedures for personnel and personal protective equipment (PPE); 2) decontamination procedures for construction equipment, materials, and vehicles; 3) treatment/disposal of residual waste from decontamination; and 4) monitoring procedures to evaluate the effectiveness of decontamination.

- Transport excavated materials to an appropriate off-site treatment/disposal facility(ies) permitted to accept the materials. Each vehicle will be inspected before it leaves the Site and cleaned of visible soil or debris within an on-site temporary decontamination area, in accordance with the remedial design.
- Treat water generated during excavation on-site and discharge to Buttermilk Channel in accordance with permit equivalent requirements.
- Restore excavated areas with appropriate fill that meets DER-10 requirements and is suitable for the property development. Additionally, as described in the following section, backfill will be amended with gypsum at a concentration of up to 5% by dry weight from the bottom of each excavation to approximately 5 feet bgs (i.e., saturated zone, incorporating the approximate seasonal high water table).
- Demobilize all equipment and materials from the Site.

3.2 In-Situ Treatment

In-situ treatment through Engineered Anaerobic Biological Oxidation (ABOx) will consist of subsurface emplacement of gypsum (calcium sulfate dihydrate [$CaSO_4*2H_2O$]) to provide a long-term source of sulfate to facilitate the ongoing ABOx of petroleum tar-related impacts at the Site. Provided below is a description of the in-situ treatment work to emplace sulfate (non-oxygen electron acceptor) by amending the backfill with gypsum within the saturated zone for each of the excavation areas. Sulfate addition via gypsum will stimulate indigenous sulfate reducing bacteria (SRB) populations to degrade petroleum tar-related constituents, capitalizing on existing anaerobic (reduced) subsurface conditions to enhance the ongoing natural source zone depletion (NSZD).

3.2.1 Engineered ABOx Overview

ABOx is biological degradation of petroleum hydrocarbons in the absence of oxygen. Engineered ABOx for this Site will use sulfate, a non-oxygen electron acceptor, in the form of sparingly soluble gypsum to provide a long-term electron acceptor. The resultant increase in sulfate from the gypsum emplacement will facilitate the degradation of dissolved phase constituents, which enhances NAPL dissolution.

Gypsum is sparingly soluble (solubility 2,400 milligrams/liter [1,300 milligrams/liter as sulfate]) and will dissolve gradually over a long period of time (years). The gypsum is expected to dissolve to its solubility, and then SRB will respire the sulfate while oxidizing dissolved phase petroleum tar-related constituents. As the dissolved phase petroleum tar-related constituents decrease, more NAPL and adsorbed phase mass will dissolve into the groundwater in a dynamic equilibrium. Similarly, as the dissolved sulfate is respired by the SRB, more gypsum will dissolve.

Emplacement of gypsum will not result in permanent or widespread secondary water quality effects. Short-term effects of gypsum emplacement on groundwater chemistry will include an initial increase in sulfate concentrations before consumption by SRB, an increase in the population of SRB, and precipitation of metal sulfides as sulfate is reduced to sulfide in the presence of naturally occurring metals. Long-term effects on groundwater chemistry are expected to be minimal due to consumption of the sulfate and the reaction byproducts. As identified in existing project related reports, including the Remedial Investigation (RI) Report

(AESI 2017a) and HHEA (Arcadis 2018a), people are not drinking the groundwater because the area is served by a public water supply that is not influenced by the Site, there are no groundwater supply wells located at or in the vicinity of the Site, and New York City's drinking water is supplied from reservoirs located in upstate New York.

3.2.2 Engineered ABOx Implementation

Each of the IRM excavation areas will be backfilled to grade with off-site general fill that complies with the Remedial Design (including NYSDEC DER-10), and gypsum will be mixed within the backfill to provide a long-term source of sulfate and facilitate the ongoing degradation of petroleum tar-related constituents at the Site. The saturated backfill (i.e., extending below the groundwater elevation) will be amended with gypsum at a concentration of up to 5% by dry weight from the bottom of each excavation to approximately 5 feet bgs (i.e., saturated zone, incorporating the approximate seasonal high water table). The general fill and gypsum will be thoroughly blended to create a homogenous mixture within the specified depth interval prior to achieving appropriate compaction. The balance of each excavation area will be backfilled with the general fill.

The in-situ treatment work will be conducted in accordance with the IRM Remedial Design, including current Arcadis Site-specific HASP and CAMP.

3.3 Proposed Additional Site Remedy Components

In conjunction with the above IRM components, the following are the proposed additional Site remedy components for RH3:

- Engineering Control in the form of a ground surface cover (e.g., 1-foot thick cover of soil that meets applicable NYSDEC SCOs, building, asphalt, sidewalk, etc.). A ground cover (asphalt) currently exists on the Site.
- Potential Engineering Control in the form of vapor mitigation measures (e.g., vapor barrier) if a building(s) is to be constructed onsite.
- Institutional Controls (e.g., deed restrictions or environmental easements) to govern future development and limit use of groundwater, as well as manage subsurface activities. Institutional controls will be established following the completion of the IRM construction activities.
- SMP that will (in general) document protocols and requirements to manage exposure to contamination remaining at the Site, including (but not necessarily limited to) the following activities: future subsurface activities (e.g., excavation); methods for reducing and repairing disturbances or damage to the ground surface cover; proper management of potentially impacted material encountered during future subsurface activities; and periodic inspection, certification and reporting. The SMP will be prepared in accordance with current NYSDEC guidance.

4 EXCAVATION IRM PERMITS AND APPROVALS

The Excavation IRM design will be developed to meet applicable SCGs, permits, and approvals. In addition to NYSDEC review/approval of the Excavation IRM design submittals (details provided in Section 5), permits and approvals will be necessary to implement the Excavation IRM.

Section 1.10 of DER-10 (Exemptions from Obtaining NYS and Local Permits and Other Authorizations) specifies that exemptions may be granted from state and local permits required for the implementation of remedial construction activities, provided that the substantive requirements of the permit programs are followed. The Excavation IRM Design will be prepared to meet such requirements and other applicable local, state, and federal rules and regulations. An initial summary of the potential Excavation IRM agreements/permits/approvals is provided below (additional permits and approvals may be identified during the development of the Excavation IRM Design).

- Effluent Discharge Permit – Approval for groundwater discharge to surface water (Buttermilk Channel) under a SPDES permit equivalent.
- Long Island Well Permit Equivalent – Approval for groundwater withdrawal is required when the total withdrawal capacity of a well or wells on one property is over 45 gpm.
- Tidal Wetlands Permit Equivalent – Approval for activities (i.e., discharge of treated water into Buttermilk Channel) in tidal wetlands and their adjacent areas.
- Special Flood Hazard Zone – Based on the Federal Emergency Management Agency (FEMA) National Flood Insurance Program Flood Insurance Rate Map Number 3604970192F, Panel Number 0192, Suffix F dated September 5, 2007, the Site is located within Zones AE and X. Zone AE is designated the area of Special Flood Hazard Zone, which is defined as an area subject to flooding by the 1 percent annual chance flood. Zone X is designated for areas of 0.2 percent annual chance flood; areas of 1 percent annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1 percent annual chance flood. Accordingly, federal and local flood management laws and regulations are potentially applicable to certain IRM construction activities (e.g., excavation). The need to obtain construction permits and/or approvals for conducting work within the Special Flood Hazard Zone will be evaluated and identified during the remedial design.
- Roadway/Sidewalk Permits – Local and/or state traffic permits (e.g., temporary occupancy of street for equipment, sidewalk closure, etc.) may be required to implement the Excavation IRM.
- Miscellaneous Plans and Approvals – Additional plans/approvals will be prepared/obtained as necessary to implement the Excavation IRM (e.g., NYCDEP's Construction Noise Mitigation Plan, Cranes and Derricks Permit, etc.).

5 EXCAVATION IRM DESIGN SUBMITTALS AND SCHEDULE

This section identifies the information anticipated to be included in the Excavation IRM Design. The Excavation IRM will be conducted in accordance with the NYSDEC-approved design documents, under the supervision and control of BT Red Hook, LLC, and will be performed to the satisfaction of the NYSDEC in accordance with the BCA. Accordingly, consistent with the requirements set forth in that document and DER-10, it is anticipated that the following IRM remedial design submittals will be prepared:

- 95% IRM Design Submittal
- Final 100% IRM Design Submittal

The contents of each IRM design submittal are presented below.

5.1 95% Excavation IRM Design Submittal

The 95% Excavation IRM Design Submittal will incorporate the elements of the IRM into a set of plans and specifications, generally including the following information:

- Set of engineering design drawings and technical specifications that represent an accurate identification of existing site conditions and an illustration of the proposed work. The design drawings will provide provisions to facilitate coordination with redevelopment activities, to the extent necessary/practicable, to minimize adverse impacts to the redevelopment schedule.
- HASP prepared in accordance with the most recently adopted and applicable general industry (29 CFR 1910) and construction (29 CFR 1926) standards of the federal Occupation Safety and Health Administration (OSHA), as well as other federal, state or local applicable statues or regulations.

BT Red Hook, LLC has an existing RH3 Citizen Participation Plan (CPP), dated December 2019 that was approved by NYSDEC.

5.2 Final 100% Excavation IRM Design Submittal

Following NYSDEC review of the 95% Excavation IRM Design Submittal, the Final 100% Excavation IRM Design Submittal will be produced. The Final 100% Excavation IRM Design Submittal will address NYSDEC comments (if any), be stamped and signed by an Arcadis Professional Engineer (PE) registered in the State of New York.

5.3 Excavation IRM Design Schedule

The preliminary anticipated schedule for completing the activities identified in this IRM DWP regarding the Excavation IRM is presented below and was developed with the NYSDEC. BT Red Hook, LLC and Arcadis will continue to coordinate with NYSDEC to facilitate completion of the milestones, including scheduling of periodic project team meetings and conference calls.

Table 4 - Preliminary Excavation IRM Schedule

Activity	Anticipated Milestone Date
Draft IRM Design Work Plan	Submitted to NYSDEC March 2019; Revised submittals to NYSDEC June 3, 2019, July 9, 2019, October 10, 2019, and December 4, 2019
NYSDEC IRM Fact Sheet	Issue December 2019
IRM 30-day Public Comment Period	December 2019 - January 2020
IRM Design Submittal	Submit to NYSDEC December 2019
NYSDEC IRM Design Approval	January 2020
Implement DNAPL Excavation IRM	January - June 2020

This preliminary Excavation IRM schedule is dependent on many factors including (but not limited to), NYSDEC approval of the proposed Site remedy and receipt of NYSDEC comments on project submittals. The regular communication and interaction with NYSDEC that is ongoing will continue throughout this project to facilitate submittal development/approvals and effectively advance this project forward. Following completion of the IRM construction activities, a Construction Completion Report (CCR) will be prepared on behalf of BT Red Hook, LLC in accordance with DER-10 to document the IRM. The CCR will include the certification identified in DER-10, Section 1.5. The CCR will be included in the Final Engineering Report (FER) that document the complete remedial program for the RH3 Site, which as proposed herein, includes DNAPL excavation, Site-wide ground surface cover (engineering control), institutional controls (e.g., environmental easement or deed restriction), and SMP. Future Site activities would then be conducted in accordance with a SMP and institutional controls to be established for the Site.

A final remedy for the Site will be selected in accordance with 6 NYCRR Part 375, and documented in a remedial action plan and NYSDEC decision document.

6 REFERENCES

AESI. 2017a. Phase I Environmental Site Assessment Report – Red Hook 3 and Red Hook 4. March.

AESI. 2017b. Remedial Investigation Report, Red Hook 3, 68 Ferris Street (Block 573, Lot 100), 100 Ferris Street (Block 573, Lot 1), 242-300 Coffey Street (Block 595, Lot 70), NYSDEC BCP Site C224213. October.

Arcadis. 2018a. Human Health Exposure Assessment – Red Hook 3, Site No. C224213, 68 and 100 Ferris Street/242 and 300 Coffey Street, Brooklyn, Kings County, New York. October.

Arcadis. 2018b. Supplemental Remedial Investigation Work Plan – Red Hook 3. July.

Arcadis. 2019a. Supplemental Remedial Investigation Report - Red Hook 3 Revised, Site No. C224213, 68 and 100 Ferris Street/242 and 300 Coffey Street, Brooklyn, Kings County, New York. March.

Arcadis. 2019b. Community Air Monitoring Plan, Red Hook 3 Site No. C224213, 68 and 100 Ferris Street/242 and 300 Coffey Street and Red Hook 4 Site No. C224214, 44 and 62 Ferris Street/219 Sullivan Street, Borough of Brooklyn, Kings County, New York. Revised September.

Langan. 2016. Remedial Investigation Work Plan for Red Hook 3 Properties, Site No. C224213. August.

Malusis, Michael, et al. 2008. “A Miniature Cone for Measuring the Slump of Soil-Bentonite Cutoff Wall Backfill.” Geotechnical Testing Journal, vol. 31, no. 5, pp. 1-8. April.

NYSDEC. 2010a. DER-10 Technical Guidance for Site Investigation and Remediation. May 3. Available online at: http://www.dec.ny.gov/regulations/67386.html.

NYSDEC. 2010b. DEC Policy CP-51 Soil Cleanup Guidance. October. Available online at: https://www.dec.ny.gov/docs/remediation_hudson_pdf/cpsoil.pdf

NYSDEC. 2019. Human Health Exposure Assessment Approval Letter from NYSDEC to Arcadis. March 19, 2019.

NYSDEC. 2019. IRM Draft Design Work Plan Comment Letter from NYSDEC to Arcadis. May 24, 2019.

FIGURES

REFERENCE: BASE MAP USGS 7.5 MIN. TOPO. QUADS., JERSEY CITY, NJ-NY, 2016

0 1000' 2000'

Approximate Scale: 1 in. = 1000 ft.

DRAFT

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET / 242 AND 300 COFFEY STREET
BROOKLYN, NEW YORK
INTERIM REMEDIAL MEASURE DESIGN WORK PLAN

SITE LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1

LEGEND:

- BLOCK/LOT BOUNDARY
- FENCE
- UTILITY POLES
- BROWNFIELD BOUNDARY

NOTE:

1. BASED ON "EXISTING SITE" FIGURE (AESI MARCH 2017) AND "NY CITY DEPARTMENT OF FINANCE DIGITAL TAX MAP" (AUGUST 15, 2017).

0 100' 200'

GRAPHIC SCALE

DRAFT

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET / 300 COFFEY STREET
BROOKLYN, NEW YORK
INTERIM REMEDIAL MEASURE DESIGN WORK PLAN

SITE MAP WITH BLOCK AND LOT BOUNDARIES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2A

CITY: SYRACUSE, NY DIV/GROUP: IMDV DB: B.SMALL, K.DAVIS LD: B.SMALL PIC: C.GERACI PM: C.GERACI TM: D.NODINE LYR: ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\ANA - UNITED PARCEL SERVICE\RED HOOK 3 DESIGN\2019\B0038993.0003\01-DWG\IRM\DWP-02-TAX PARCEL MAP.dwg LAYOUT: 2A SAVED: 3/27/2019 10:25 AM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 3/27/2019 10:25 AM BY: DAVIS, KATHI
XREFS:
X00-IRM\DWP-BLR
IMAGES:

LEGEND:

- BLOCK/LOT BOUNDARY
- RED HOOK 3 BROWNFIELD SITE (BCP: C224213)
- RED HOOK 4 BROWNFIELD SITE (BCP: C224214)
- BROWNFIELD BOUNDARY

BUTTERMILK CHANNEL

BLOCK 573
LOT 100

BLOCK 573
LOT 80

BLOCK 595
LOT 70

BUILDING

BLOCK 514
LOT 40

BLOCK 514
LOT 1

SULLIVAN STREET

WOLCOTT STREET

BLOCK 573
LOT 1

DIKEMAN STREET

FERRIS STREET

BUILDING

COFFEY STREET

145-65 WOLCOTT STREET
BROWNFIELD SITE
(BCP: C224256)

NOTES:

1. BASED ON "EXISTING SITE" FIGURE (AESI MARCH 2017) AND "NY CITY DEPARTMENT OF FINANCE DIGITAL TAX MAP" (AUGUST 15, 2017).
2. ALL BOUNDARIES ARE APPROXIMATE.

0 100' 200'

GRAPHIC SCALE

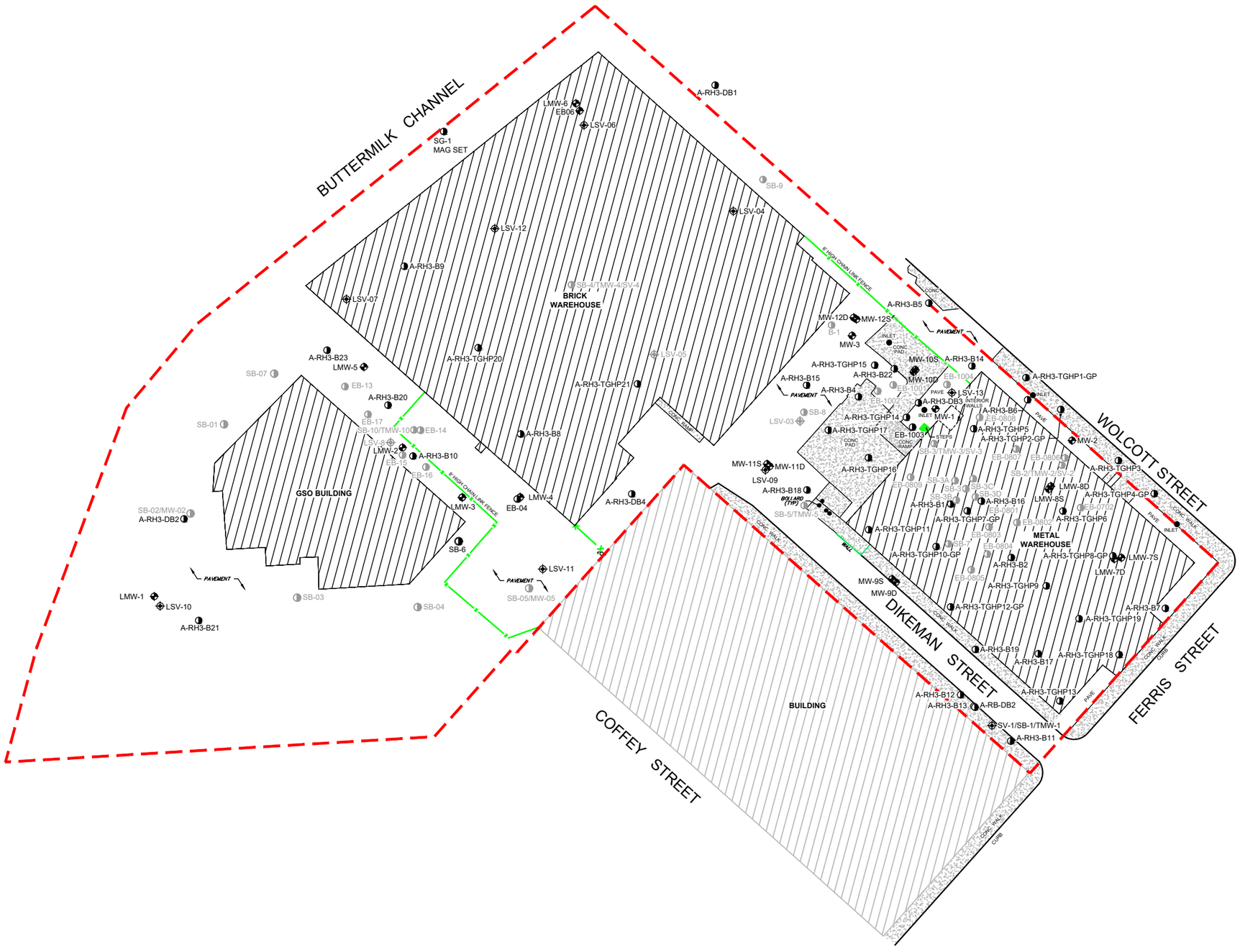
DRAFT

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET / 300 COFFEY STREET
BROOKLYN, NEW YORK
INTERIM REMEDIAL MEASURE DESIGN WORK PLAN

ADJOINING PROPERTIES

ARCADIS Design & Consultancy for natural and built assets

FIGURE
2B



LEGEND:

- MONITORING WELL
- SOIL BORING
- SOIL BORING (NOT SURVEYED)
- SOIL VAPOR MONITORING POINT
- SOIL VAPOR MONITORING POINT (NOT SURVEYED)
- SITE BOUNDARY
- FENCE
- UTILITY POLES
- TarGOST® TAR-SPECIFIC GREEN OPTICAL SCREENING TOOL

NOTES:

1. BORING/WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. BORING LOCATIONS SHOWN IN GRAY WERE NOT FIELD LOCATED OR SURVEYED BY ARCADIS AND WERE DIGITIZED FROM FIGURES PROVIDED BY AESI AND LANGAN.
4. "TGHP" INDICATES A TarGOST® LOCATION ONLY.
5. TGHP#-GP" INDICATES A GEOPROBE BORING ADVANCED IMMEDIATELY ADJACENT TO A TarGOST® LOCATION; HOWEVER, THE TarGOST® LOCATION IS NOT SHOWN. FOR EXAMPLE, A-RH3-TGHP4-GP WAS ADVANCED IMMEDIATELY ADJACENT TO TarGOST® LOCATION A-RH3-TGHP4.
6. SOIL BORINGS AND TarGOST® LOCATIONS WITH AN "A-" PREFIX WERE ADVANCED BY ARCADIS.

0 100' 200'

GRAPHIC SCALE

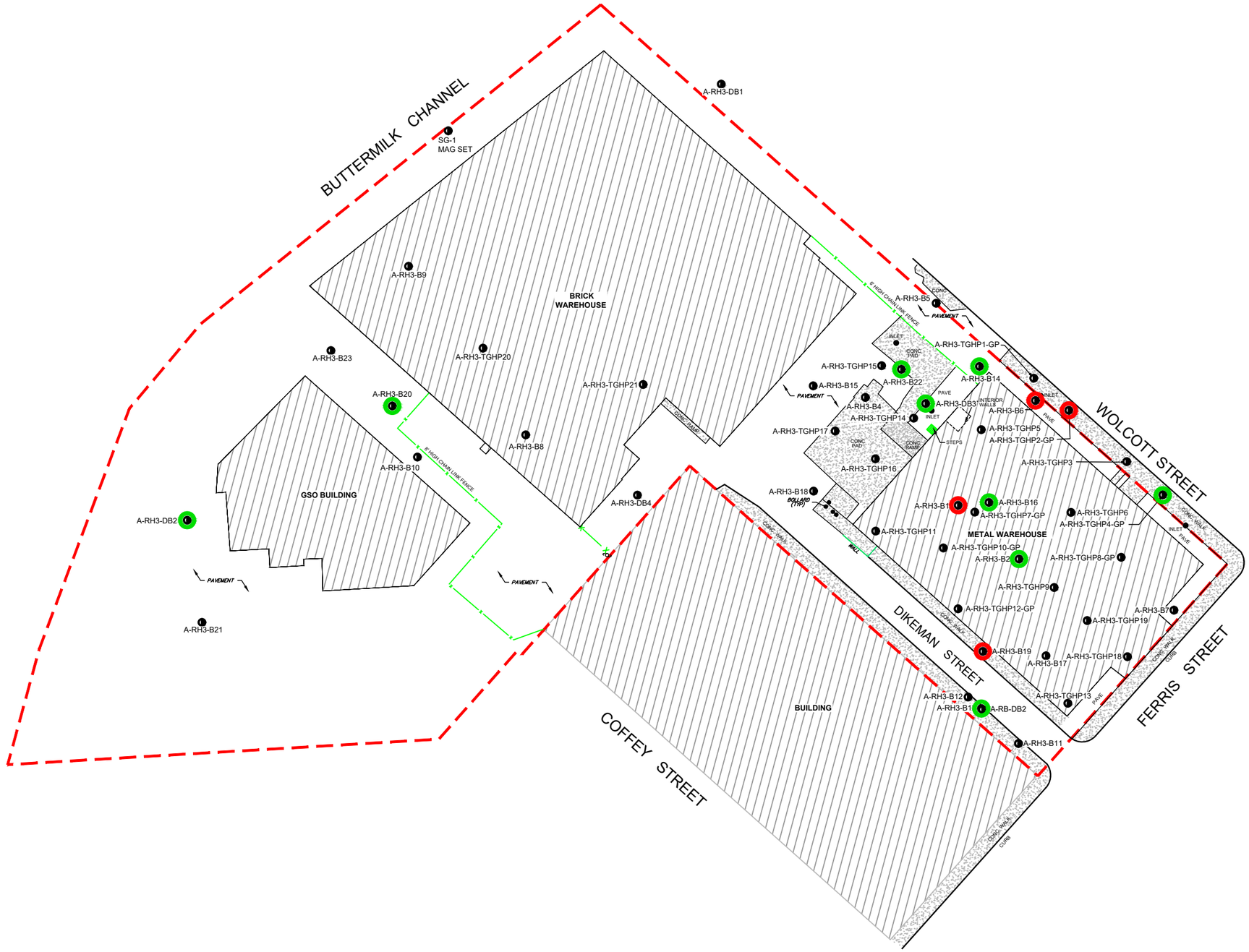
DRAFT

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET / 300 COFFEY STREET
BROOKLYN, NEW YORK
INTERIM REMEDIAL MEASURE DESIGN WORK PLAN

MONITORING WELLS AND SOIL BORINGS BY ARCADIS AND OTHERS - SUPPLEMENTAL REMEDIAL INVESTIGATION AND PRIOR

ARCADIS Design & Consultancy for natural and built assets

FIGURE 3



LEGEND:

- SOIL BORING
- SITE BOUNDARY
- FENCE
- UTILITY POLES
- VISIBLE NAPL AT APPROXIMATELY 15 FEET OR SHALLOWER
- VISIBLE NAPL DEEPER THAN 15 FEET
- NAPL NON-AQUEOUS PHASE LIQUID
- TarGOST® TAR-SPECIFIC GREEN OPTICAL SCREENING TOOL

NOTES:

1. BORING/WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED “ALTA/NSPS LAND TITLE SURVEY” (LANGAN APRIL 4, 2017).
3. "TGHP" INDICATES A TarGOST® LOCATION.
4. TGHP#-GP" INDICATES A GEOPROBE BORING ADVANCED IMMEDIATELY ADJACENT TO A TarGOST® LOCATION; HOWEVER, THE TarGOST® LOCATION IS NOT SHOWN. FOR EXAMPLE, A-RH3-TGHP4-GP WAS ADVANCED IMMEDIATELY ADJACENT TO TarGOST® LOCATION A-RH3-TGHP4.
5. SOIL BORINGS AND TarGOST® LOCATIONS WITH AN "A-" PREFIX WERE ADVANCED BY ARCADIS.

0 100' 200'

GRAPHIC SCALE

DRAFT

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET / 300 COFFEY STREET
BROOKLYN, NEW YORK
INTERIM REMEDIAL MEASURE DESIGN WORK PLAN

SUPPLEMENTAL REMEDIAL INVESTIGATION SOIL BORINGS ADVANCED BY ARCADIS SHOWING VISIBLE NAPL IMPACTS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 4

CITY: SYRACUSE, NY DIV/GROUP: IMDV DB: B.SMALL, K.DAVIS LD: B.SMALL PIC: C.GERACI PM: C.GERACI TM: D.NODINE LYR: ON=*;OFF=*REF*
C:\BIM\OneDrive - ARCADIS\BIM 360 Docs\UNITED PARCEL SERVICE\Red Hook 3 Design\2019\B0038993.0003\01-DWG\IRMDWP-05-SB-NAPL.dwg LAYOUT: 4 SAVED: 7/8/2019 9:53 AM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 7/8/2019 9:54 AM BY: WASILEWSKI, MATT
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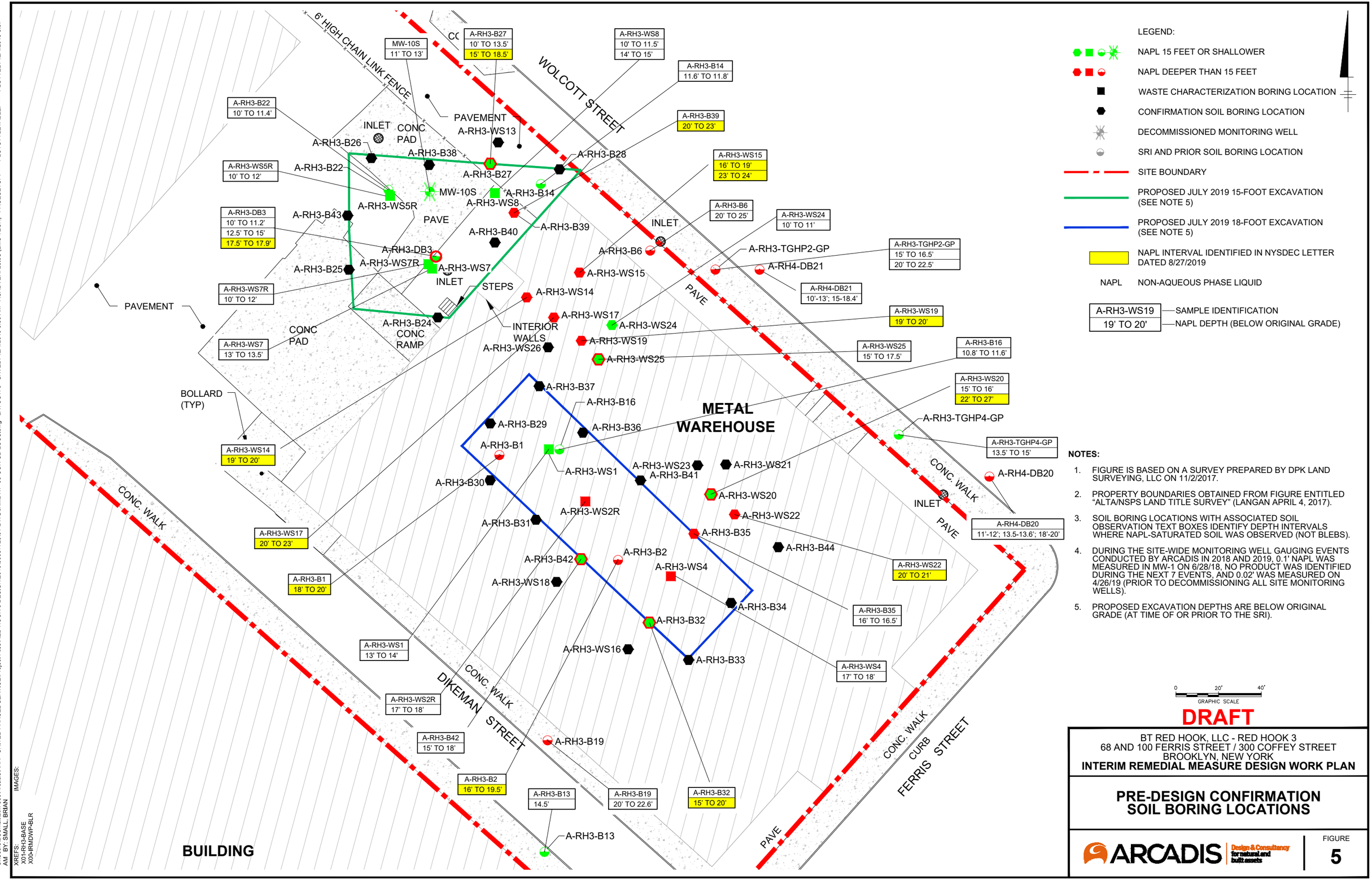
X00-IRMDWP-BLR
IMAGES:



LEGEND:

- NAPL 15 FEET OR SHALLOWER
- NAPL DEEPER THAN 15 FEET
- WASTE CHARACTERIZATION BORING LOCATION
- CONFIRMATION SOIL BORING LOCATION
- DECOMMISSIONED MONITORING WELL
- SRI AND PRIOR SOIL BORING LOCATION
- SITE BOUNDARY
- PROPOSED JULY 2019 15-FOOT EXCAVATION (SEE NOTE 5)
- PROPOSED JULY 2019 18-FOOT EXCAVATION (SEE NOTE 5)
- NAPL INTERVAL IDENTIFIED IN NYSDEC LETTER DATED 8/27/2019
- NAPL — NON-AQUEOUS PHASE LIQUID

A-RH3-WS19 — SAMPLE IDENTIFICATION
19' TO 20' — NAPL DEPTH (BELOW ORIGINAL GRADE)

NOTES:

1. FIGURE IS BASED ON A SURVEY PREPARED BY DPK LAND SURVEYING, LLC ON 11/2/2017.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. SOIL BORING LOCATIONS WITH ASSOCIATED SOIL OBSERVATION TEXT BOXES IDENTIFY DEPTH INTERVALS WHERE NAPL-SATURATED SOIL WAS OBSERVED (NOT BLEBS).
4. DURING THE SITE-WIDE MONITORING WELL GAUGING EVENTS CONDUCTED BY ARCADIS IN 2018 AND 2019, 0.1' NAPL WAS MEASURED IN MW-1 ON 6/28/18, NO PRODUCT WAS IDENTIFIED DURING THE NEXT 7 EVENTS, AND 0.02' WAS MEASURED ON 4/26/19 (PRIOR TO DECOMMISSIONING ALL SITE MONITORING WELLS).
5. PROPOSED EXCAVATION DEPTHS ARE BELOW ORIGINAL GRADE (AT TIME OF OR PRIOR TO THE SRI).

0 20' 40'
GRAPHIC SCALE

DRAFT

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET / 300 COFFEY STREET
BROOKLYN, NEW YORK
INTERIM REMEDIAL MEASURE DESIGN WORK PLAN

PRE-DESIGN CONFIRMATION SOIL BORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 5

CITY: SYRACUSE, NY DIV/GROUP: IMDV DB: B.SMALL, K.DAVIS LD: B.SMALL PIC: C.GERACI PM: C.GERACI TM: D.NODINE LYR: ON=*;OFF=*REF*
C:\Users\BSSmall\BIM 360\Arcadis\ANA - UNITED PARCEL SERVICE\Project Files\RED HOOK 3 DESIGN\2019\30037729\01-DWG\RMDWP-05-CON-SB-LOCS.dwg LAYOUT: 5 SAVED: 12/4/2019 8:36 AM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 12/4/2019 8:37 AM BY: SMALL, BRIAN
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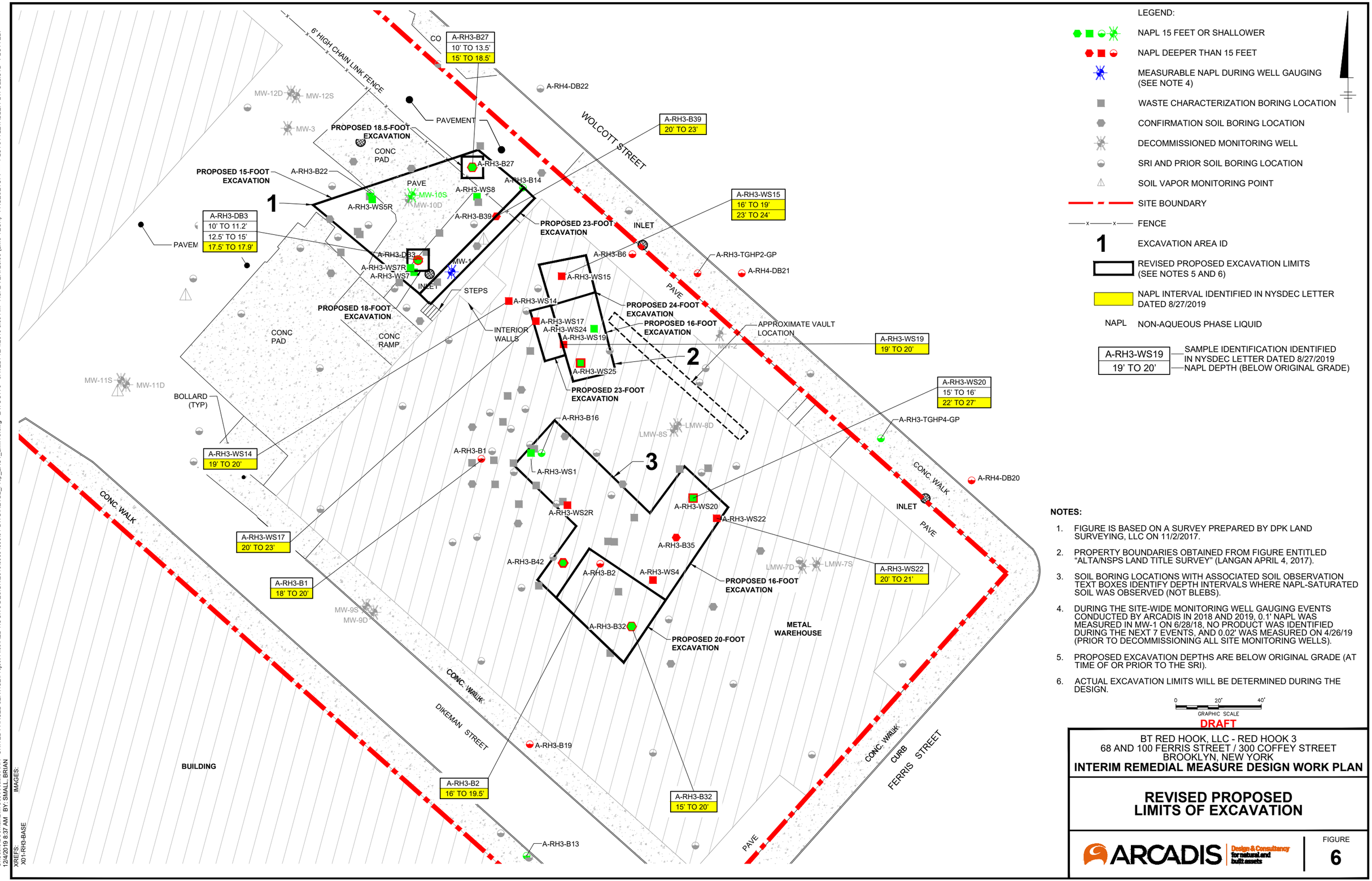
X01=RH3-BASE
X00=IRMDWP-BLR
IMAGES:



LEGEND:

- NAPL 15 FEET OR SHALLOWER
- NAPL DEEPER THAN 15 FEET
- MEASURABLE NAPL DURING WELL GAUGING (SEE NOTE 4)
- WASTE CHARACTERIZATION BORING LOCATION
- CONFIRMATION SOIL BORING LOCATION
- DECOMMISSIONED MONITORING WELL
- SRI AND PRIOR SOIL BORING LOCATION
- SOIL VAPOR MONITORING POINT
- SITE BOUNDARY
- FENCE
- 1 — EXCAVATION AREA ID
- REVISED PROPOSED EXCAVATION LIMITS (SEE NOTES 5 AND 6)
- NAPL INTERVAL IDENTIFIED IN NYSDEC LETTER DATED 8/27/2019
- NAPL — NON-AQUEOUS PHASE LIQUID

A-RH3-WS19 / 19' TO 20' — SAMPLE IDENTIFICATION IDENTIFIED IN NYSDEC LETTER DATED 8/27/2019 / NAPL DEPTH (BELOW ORIGINAL GRADE)

NOTES:

1. FIGURE IS BASED ON A SURVEY PREPARED BY DPK LAND SURVEYING, LLC ON 11/2/2017.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. SOIL BORING LOCATIONS WITH ASSOCIATED SOIL OBSERVATION TEXT BOXES IDENTIFY DEPTH INTERVALS WHERE NAPL-SATURATED SOIL WAS OBSERVED (NOT BLEBS).
4. DURING THE SITE-WIDE MONITORING WELL GAUGING EVENTS CONDUCTED BY ARCADIS IN 2018 AND 2019, 0.1' NAPL WAS MEASURED IN MW-1 ON 6/28/18, NO PRODUCT WAS IDENTIFIED DURING THE NEXT 7 EVENTS, AND 0.02' WAS MEASURED ON 4/26/19 (PRIOR TO DECOMMISSIONING ALL SITE MONITORING WELLS).
5. PROPOSED EXCAVATION DEPTHS ARE BELOW ORIGINAL GRADE (AT TIME OF OR PRIOR TO THE SRI).
6. ACTUAL EXCAVATION LIMITS WILL BE DETERMINED DURING THE DESIGN.

0 20' 40'
GRAPHIC SCALE

DRAFT

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET / 300 COFFEY STREET
BROOKLYN, NEW YORK

INTERIM REMEDIAL MEASURE DESIGN WORK PLAN

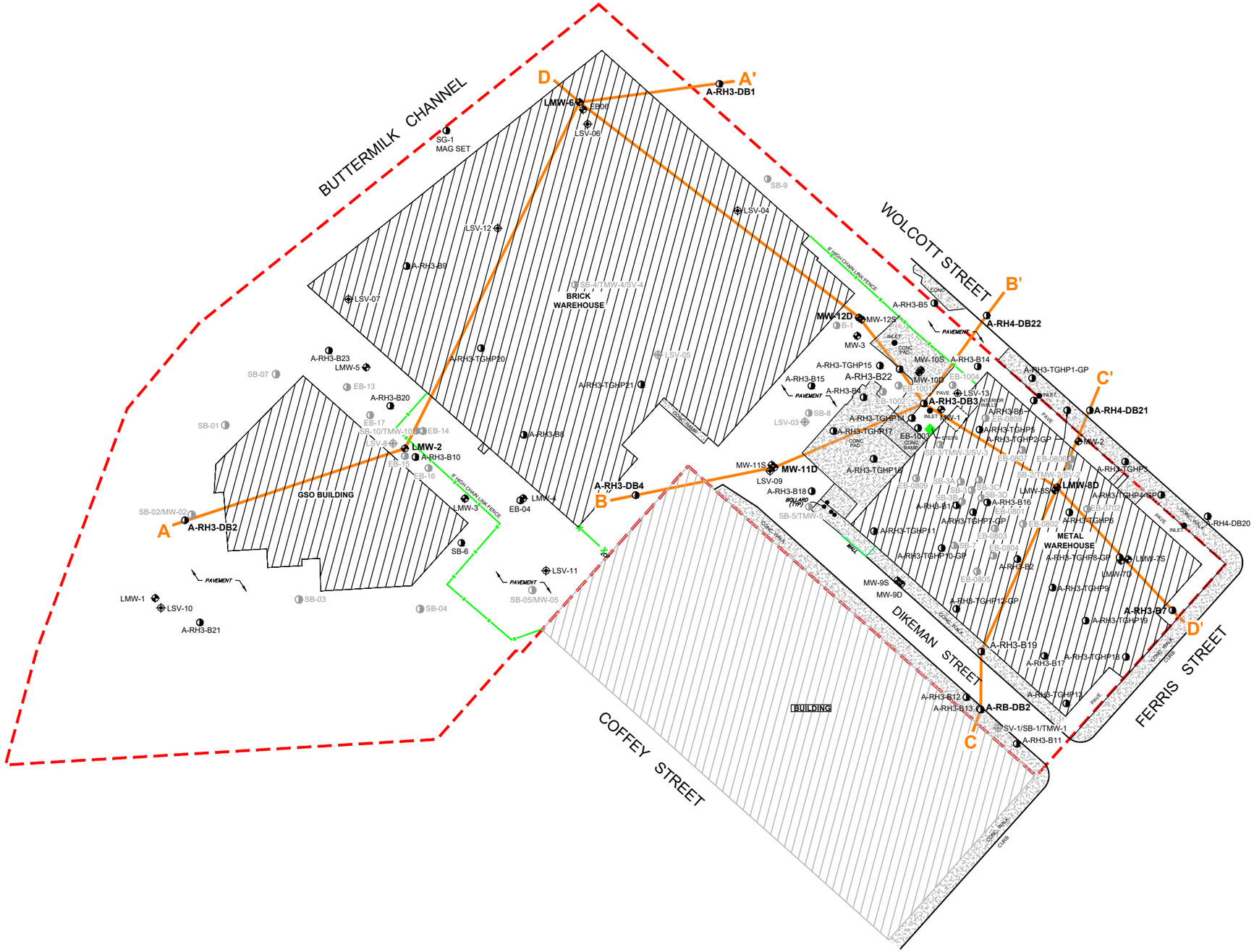
REVISED PROPOSED LIMITS OF EXCAVATION

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6

APPENDIX A

Selected Remedial Investigation/Supplemental Remedial Investigation Figures



LEGEND:

⊕	MONITORING WELL
◐	SOIL BORING
◐	SOIL BORING (NOT SURVEYED)
⊕	SOIL VAPOR MONITORING POINT
⊕	SOIL VAPOR MONITORING POINT (NOT SURVEYED)
🟥	SITE BOUNDARY
🟩	FENCE
☌	UTILITY POLES
A——A'	GEOLOGIC CROSS-SECTION TRANSECT

NOTES:

1. BORING/WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
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7. SOIL BORINGS AND TarGOST® LOCATIONS WITH AN "A-" PREFIX WERE ADVANCED BY ARCADIS.

0 60' 120'

GRAPHIC SCALE

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GEOLOGIC CROSS SECTION LOCATION MAP

ARCADIS Design & Consultancy for natural and built assets

FIGURE
I-1

CITY: SYRACUSE, NY DIV/GROUP: EBC-IMDV DB: L.POSENAUER PM: A.KORIK TM: D.CORNELL LYR:(Opt)ON=*;OFF=*REF*
C:\Users\lposenauer\OneDrive - ARCADIS\BIM 360 Docs\UNITED PARCEL SERVICE\Red Hook 3 Remedial Alternatives\2018\B0038993.0002\01-DWG\RH3-SRI_GEO CROSS SECTION LOC MAP_A-B-C-D.dwg LAYOUT: I-1 SAVED: 12/21/2018 10:51 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---
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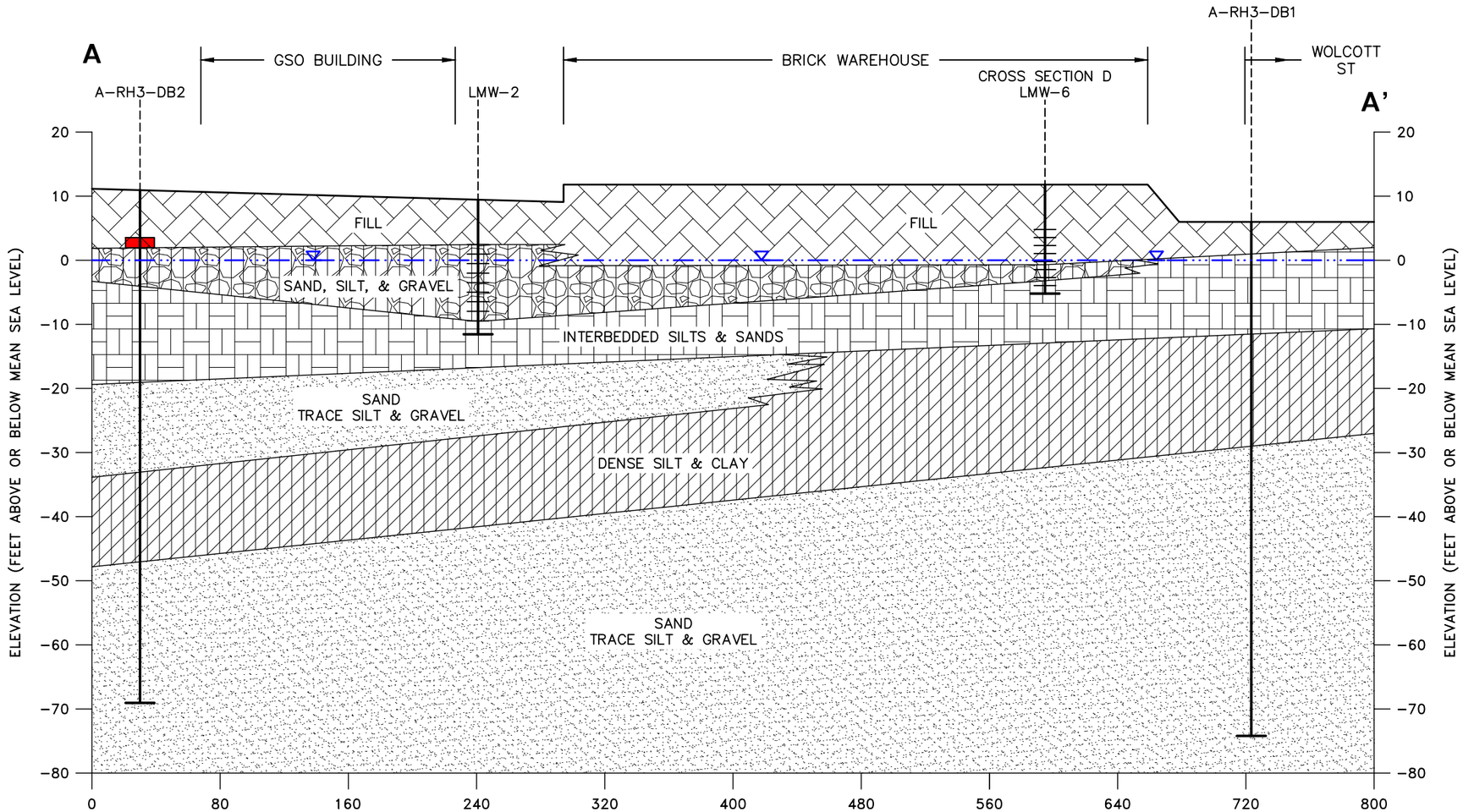

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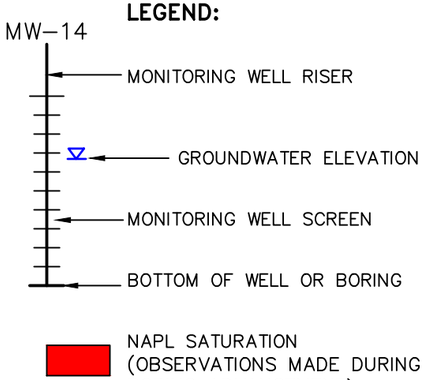
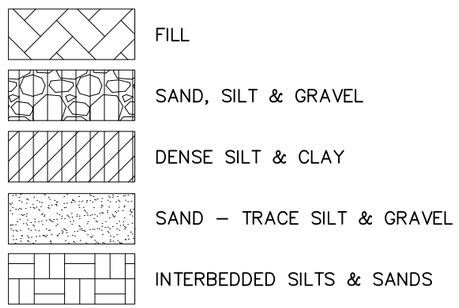
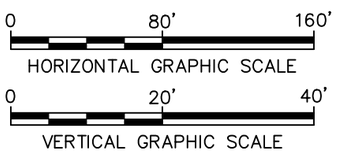




NOTES:

1. GROUNDWATER TABLE DEPICTED ON FIGURE IS APPROXIMATE AND IS INFLUENCED BY THE TIDE.
2. COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM NEW YORK LONG ISLAND STATE PLANE COORDINATE NAD 83.
3. ELEVATIONS ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM (NAVD) OF 88.
4. ALL LOCATIONS ARE APPROXIMATE.
5. SOIL LAYERS AND GEOLOGICAL CONTACT LOCATIONS ARE APPROXIMATE AND INFERRED BETWEEN BORING LOCATIONS.

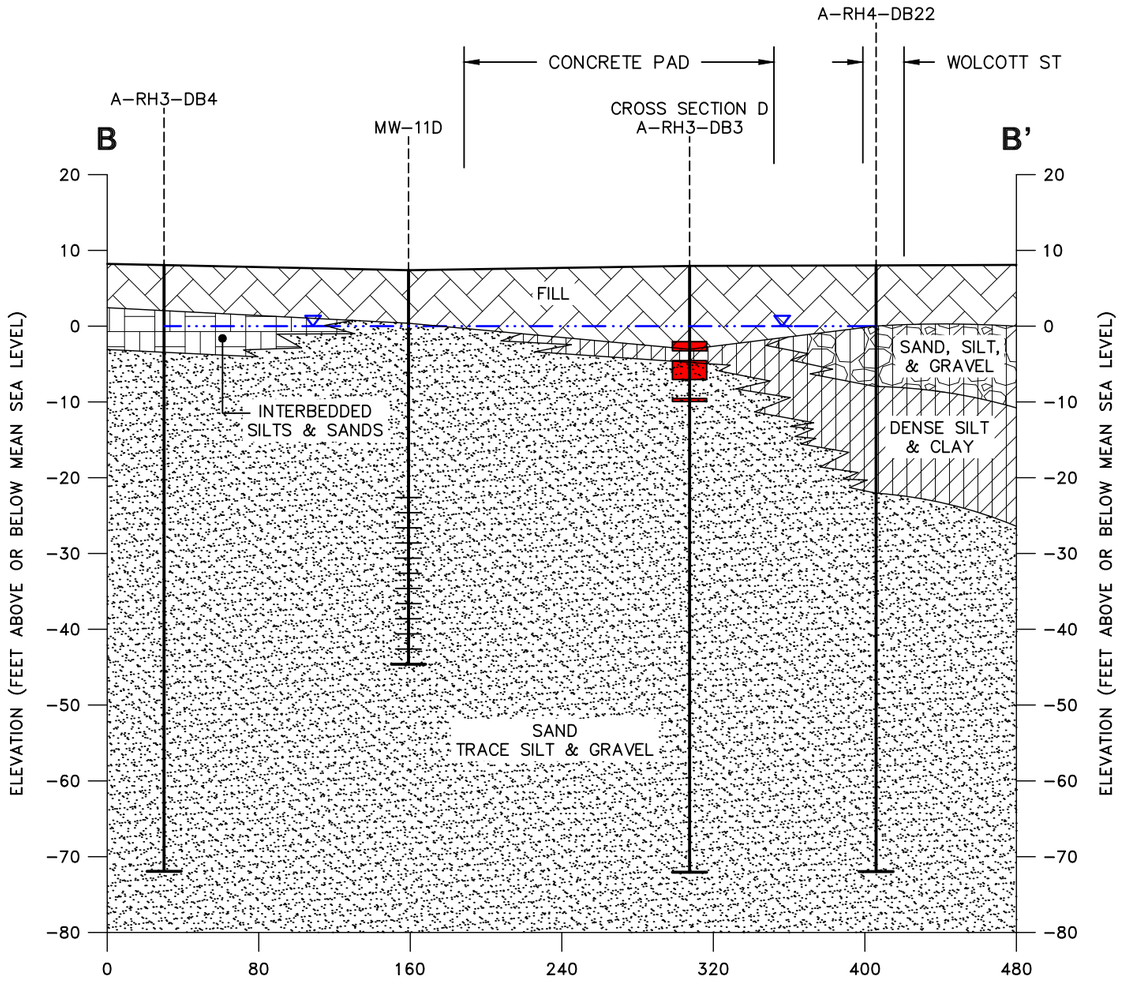


BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GEOLOGIC CROSS SECTION A-A'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
I-2



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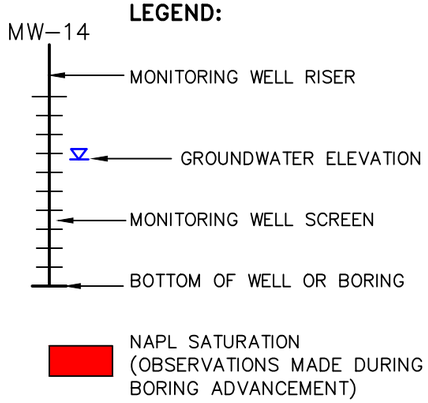
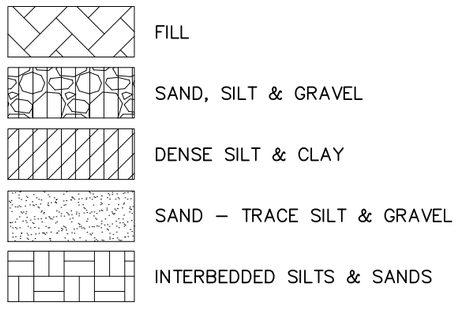
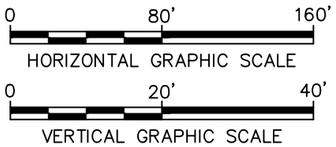




NOTES:

1. GROUNDWATER TABLE DEPICTED ON FIGURE IS APPROXIMATE AND IS INFLUENCED BY THE TIDE.
2. COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM NEW YORK LONG ISLAND STATE PLANE COORDINATE NAD 83.
3. ELEVATIONS ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM (NAVD) OF 88.
4. ALL LOCATIONS ARE APPROXIMATE.
5. SOIL LAYERS AND GEOLOGICAL CONTACT LOCATIONS ARE APPROXIMATE AND INFERRED BETWEEN BORING LOCATIONS.

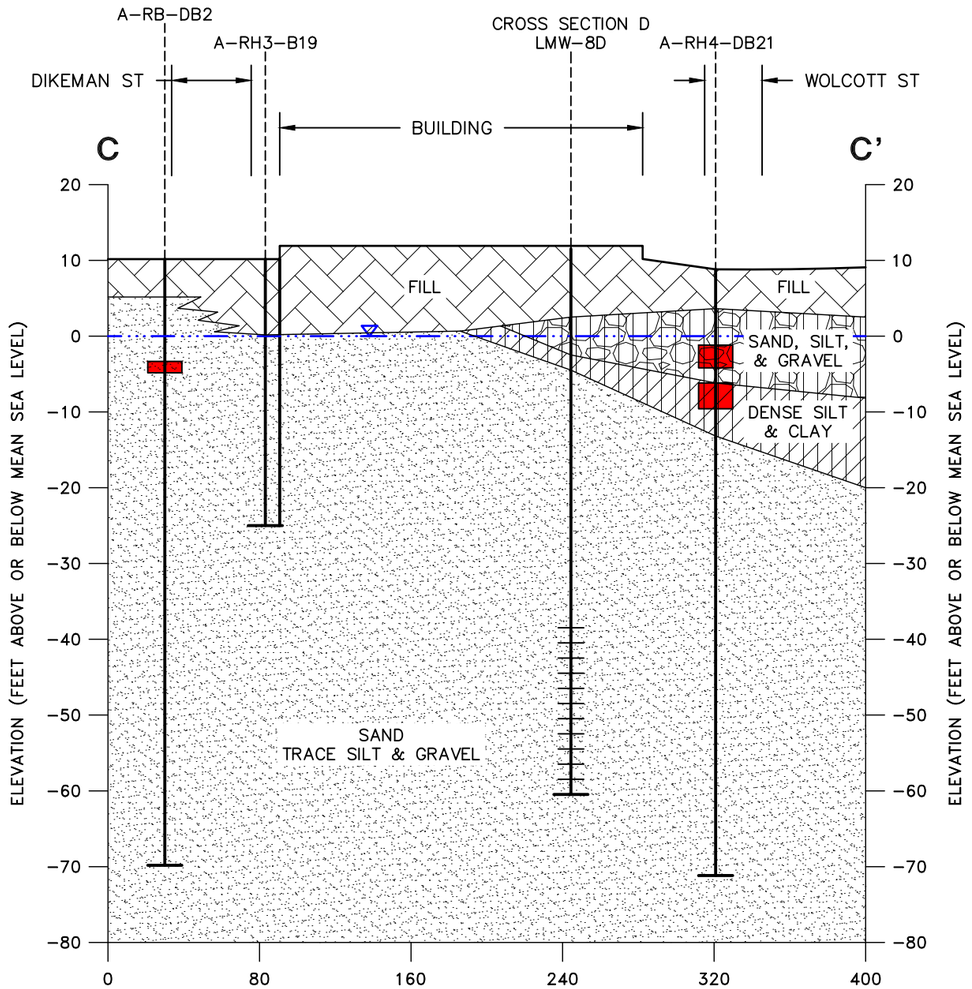


BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GEOLOGIC CROSS SECTION B-B'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
I-3



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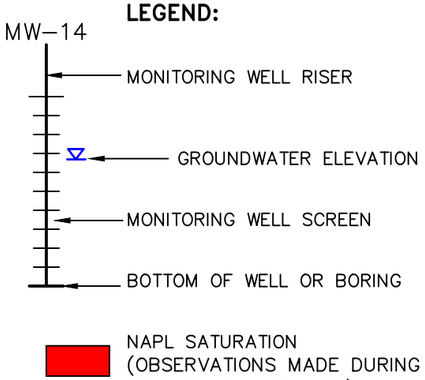
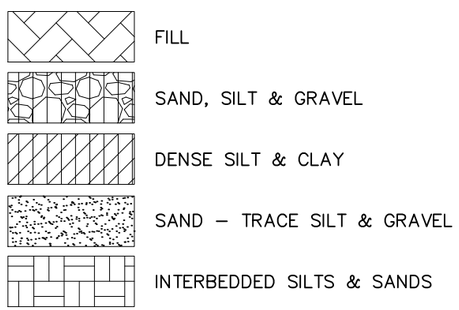
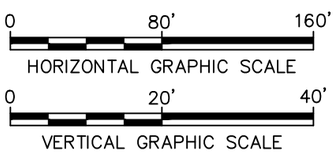




NOTES:

1. GROUNDWATER TABLE DEPICTED ON FIGURE IS APPROXIMATE AND IS INFLUENCED BY THE TIDE.
2. COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM NEW YORK LONG ISLAND STATE PLANE COORDINATE NAD 83.
3. ELEVATIONS ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM (NAVD) OF 88.
4. ALL LOCATIONS ARE APPROXIMATE.
5. SOIL LAYERS AND GEOLOGICAL CONTACT LOCATIONS ARE APPROXIMATE AND INFERRED BETWEEN BORING LOCATIONS.

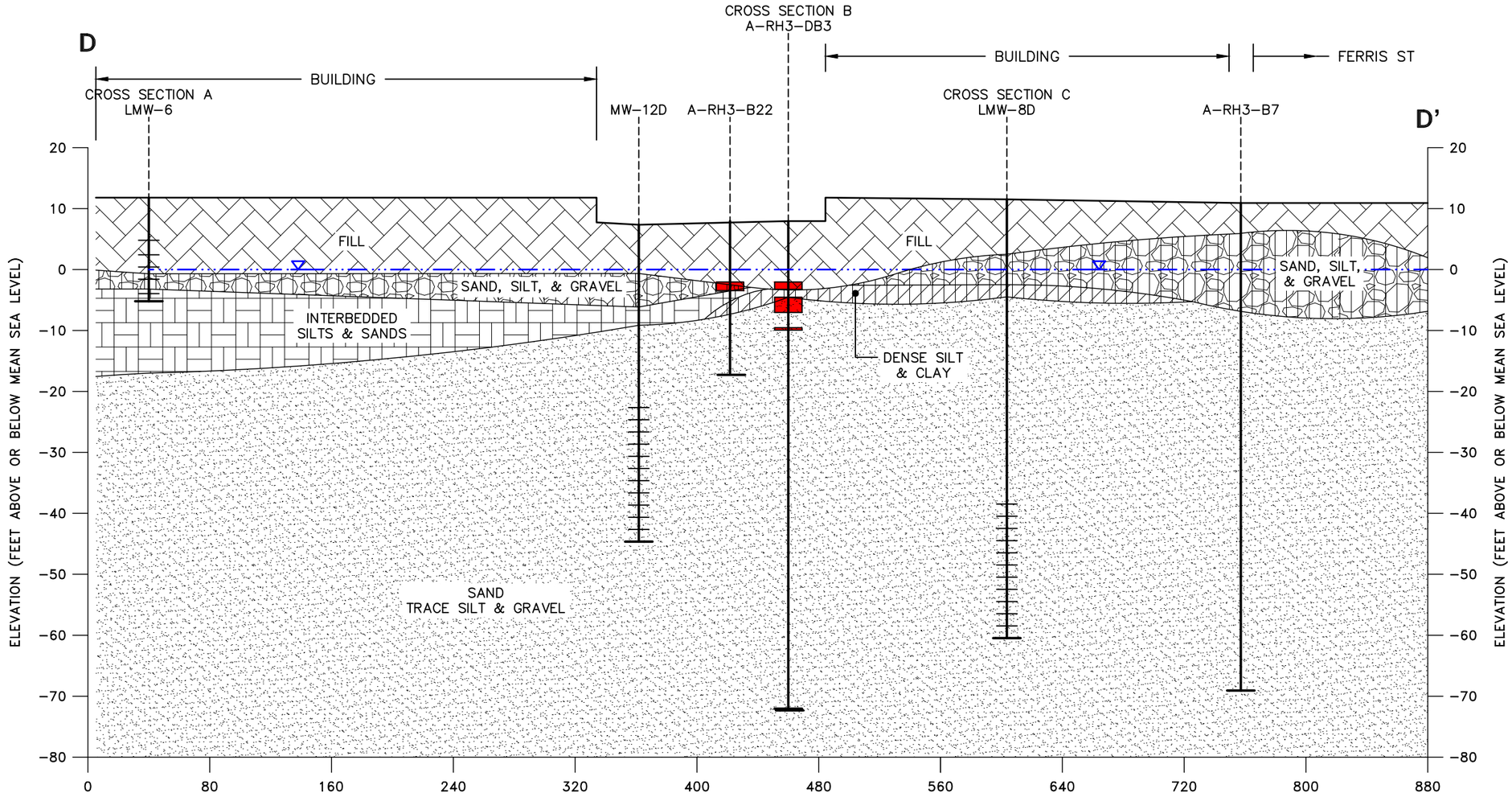


BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GEOLOGIC CROSS SECTION C-C'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
I-4



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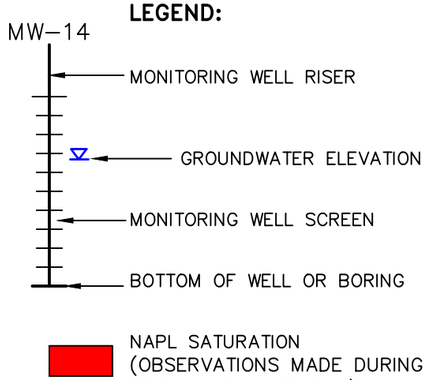
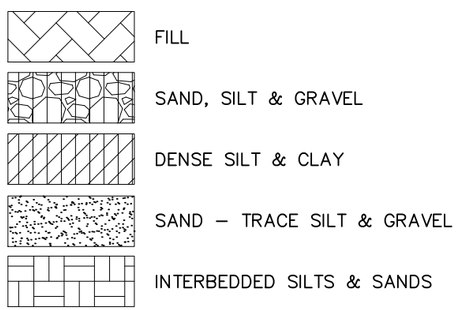
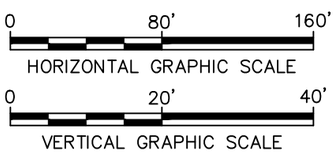




NOTES:

1. GROUNDWATER TABLE DEPICTED ON FIGURE IS APPROXIMATE AND IS INFLUENCED BY THE TIDE.
2. COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM NEW YORK LONG ISLAND STATE PLANE COORDINATE NAD 83.
3. ELEVATIONS ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM (NAVD) OF 88.
4. ALL LOCATIONS ARE APPROXIMATE.
5. SOIL LAYERS AND GEOLOGICAL CONTACT LOCATIONS ARE APPROXIMATE AND INFERRED BETWEEN BORING LOCATIONS.



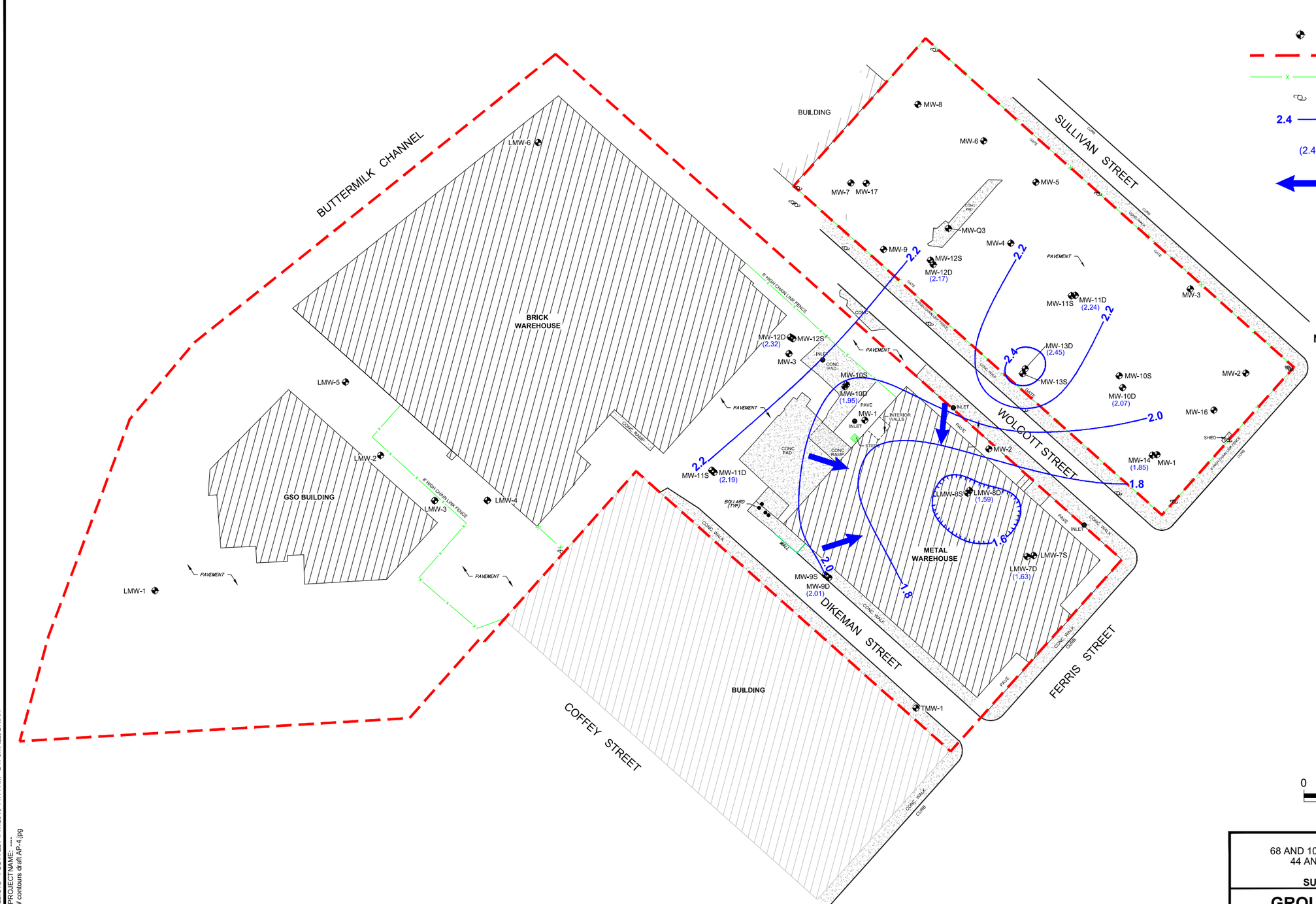
BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
BROOKLYN, NEW YORK

SUPPLEMENTAL REMEDIAL INVESTIGATION

GEOLOGIC CROSS SECTION D-D'

ARCADIS Design & Consultancy for natural and built assets

FIGURE
I-5



LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- FENCE
- UTILITY POLES
- 2.4 GROUNDWATER ELEVATION CONTOUR
- (2.45) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. CONTOUR INTERVAL = 0.2 FEET.

0 100' 200'

GRAPHIC SCALE

BT RED HOOK, LLC - RED HOOK 3 & 4
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
44 AND 62 FERRIS STREET/219 SULLIVAN STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GROUNDWATER CONTOUR MAP DEEP WELLS HIGH TIDE, SEPTEMBER 10, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 12

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\BSSmall\OneDrive - ARCADIS\BIM 360 Docs\UNITED PARCEL SERVICE\UPS Red Hook\Red Hook 3\2018\B0038932.0003\01-DWG\SSR\Figure 12 - RH3-13-RH4 GWCM-DW HIGH TIDE.dwg LAYOUT: 12 SAVED: 1/17/2019 11:12 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ----
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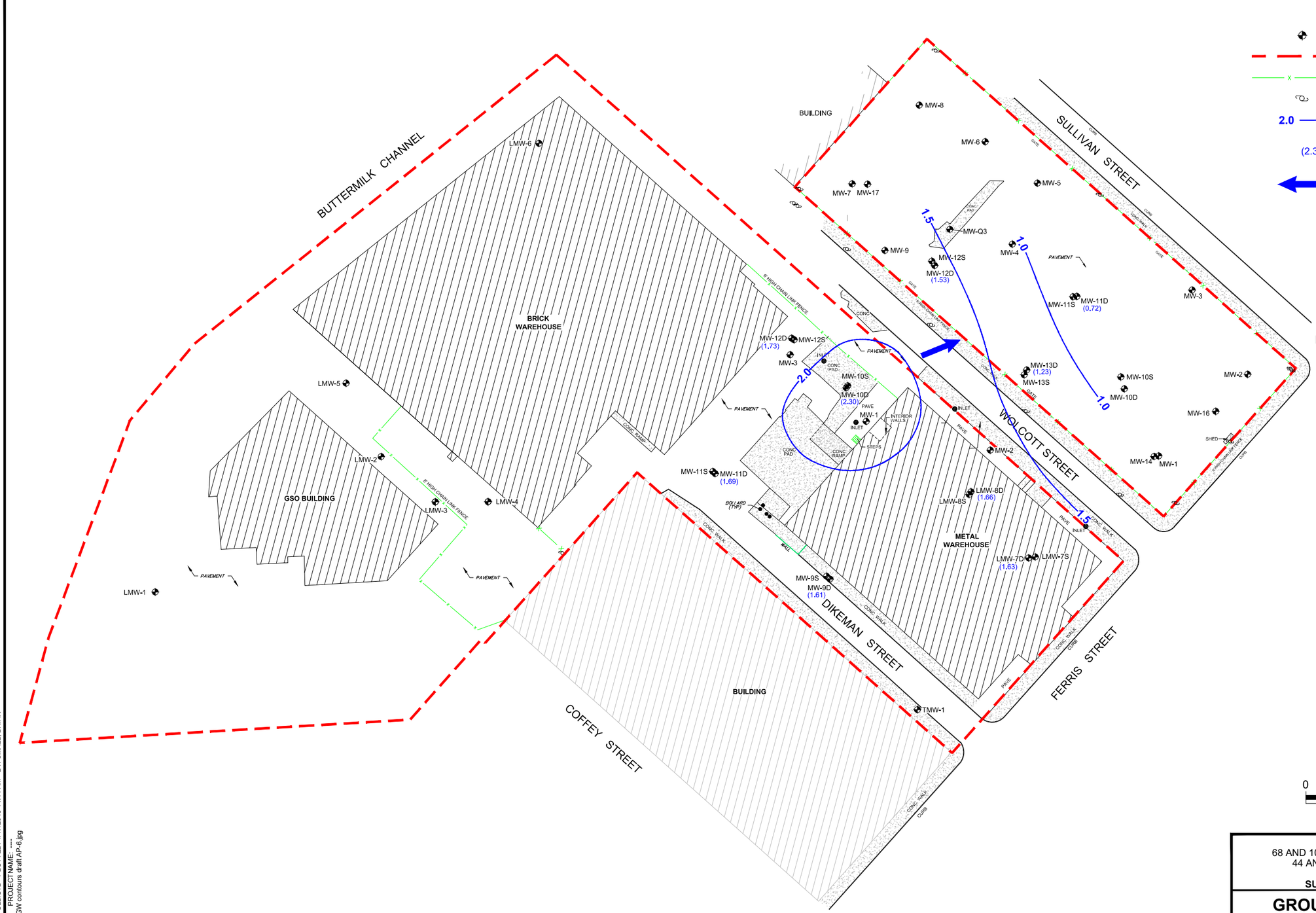

LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- FENCE
- UTILITY POLES
- 2.0 GROUNDWATER ELEVATION CONTOUR
- (2.30) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. CONTOUR INTERVAL = 0.5 FEET.
4. TIDAL STAGE BASED ON SURFACE WATER ELEVATION.

0 100' 200'

GRAPHIC SCALE

BT RED HOOK, LLC - RED HOOK 3 & 4
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
44 AND 62 FERRIS STREET/219 SULLIVAN STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GROUNDWATER CONTOUR MAP DEEP WELLS MID-TIDAL CYCLE, SEPTEMBER 12, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 13

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\BSmall\OneDrive - ARCADIS\BIM 360 Docs\UNITED PARCEL SERVICE\UPS Red Hook\Red Hook 3\2018\B0038932.0003\01-DWG\SRI\Figure 13 - RH3-14-RH4 GWCM-DW MID-TIDAL.dwg LAYOUT: 13 SAVED: 1/17/2019 11:12 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ----
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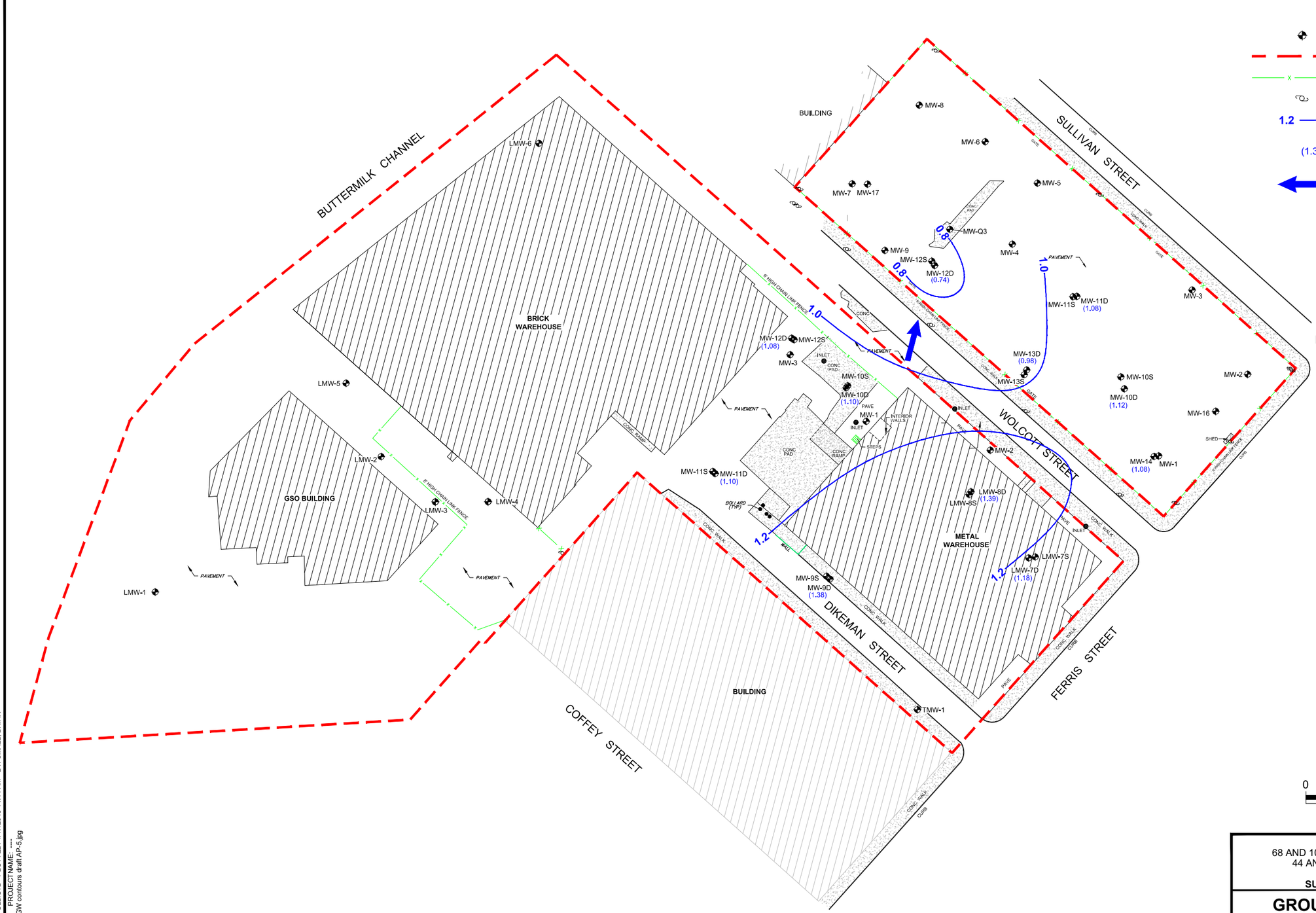
XREFS: IMAGES: PROJECTNAME: ----
Red Hook GW contours draft AP-6.jpg



LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- FENCE
- UTILITY POLES
- 1.2 GROUNDWATER ELEVATION CONTOUR
- (1.39) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. CONTOUR INTERVAL = 0.2 FEET.

0 100' 200'

GRAPHIC SCALE

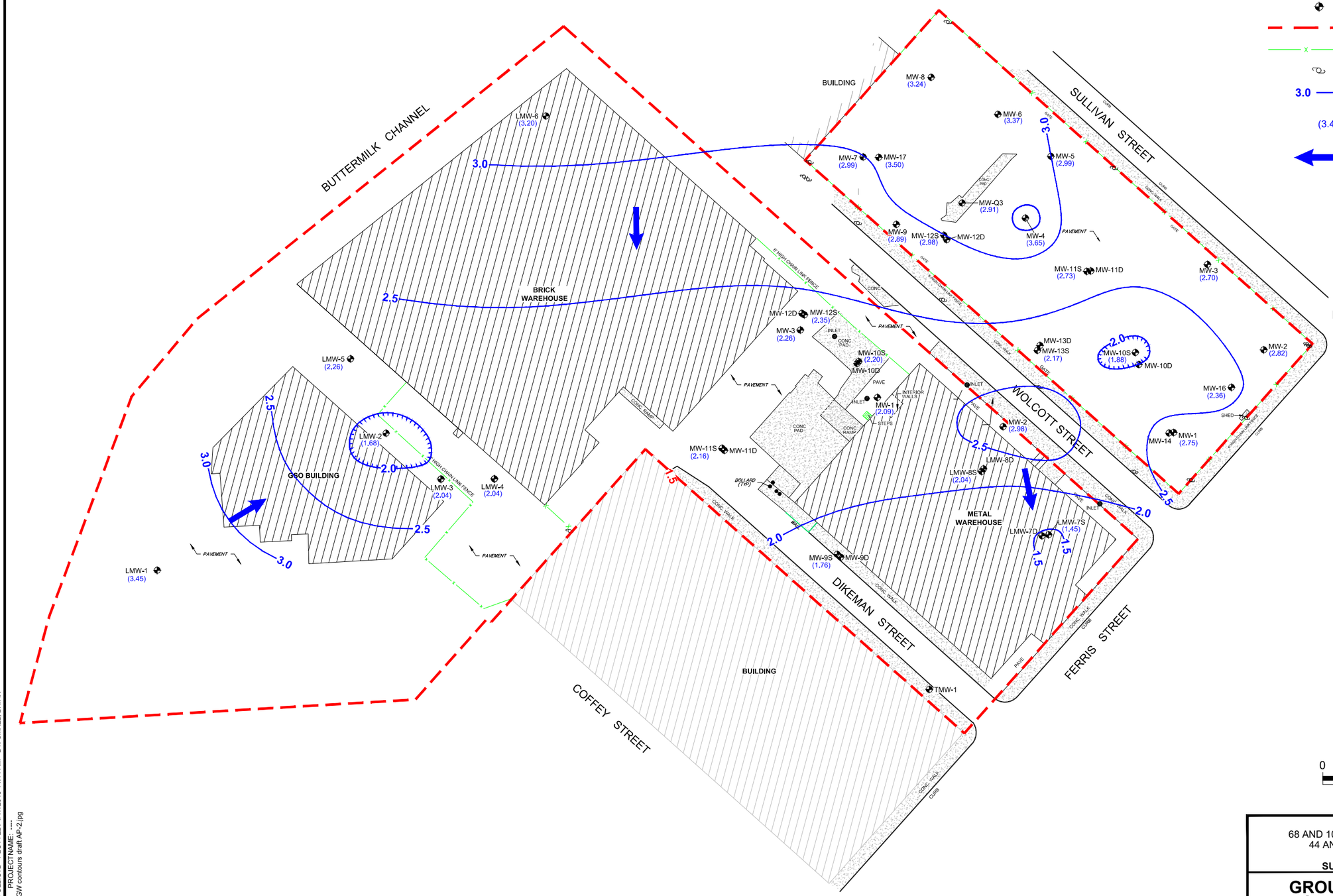
BT RED HOOK, LLC - RED HOOK 3 & 4
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
44 AND 62 FERRIS STREET/219 SULLIVAN STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GROUNDWATER CONTOUR MAP DEEP WELLS LOW TIDE, SEPTEMBER 10, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 14

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\BSmall\OneDrive - ARCADIS\BIM 360 Docs\UNITED PARCEL SERVICE\UPS Red Hook\Red Hook 3\2018\B0038932.0003\01-DWG\SR\Figure 14 - RH3-15-RH4 GWCM-DW LOW TIDE.dwg LAYOUT: 14 SAVED: 1/17/2019 11:12 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/17/2019 11:14 AM BY: SMALL, BRIAN
XREFS: IMAGES: PROJECTNAME: ----
Red Hook GW contours draft AP-5.jpg



LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- FENCE
- UTILITY POLES
- 3.0 — GROUNDWATER ELEVATION CONTOUR
- (3.45) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. CONTOUR INTERVAL = 0.5 FEET.

0 100' 200'

GRAPHIC SCALE

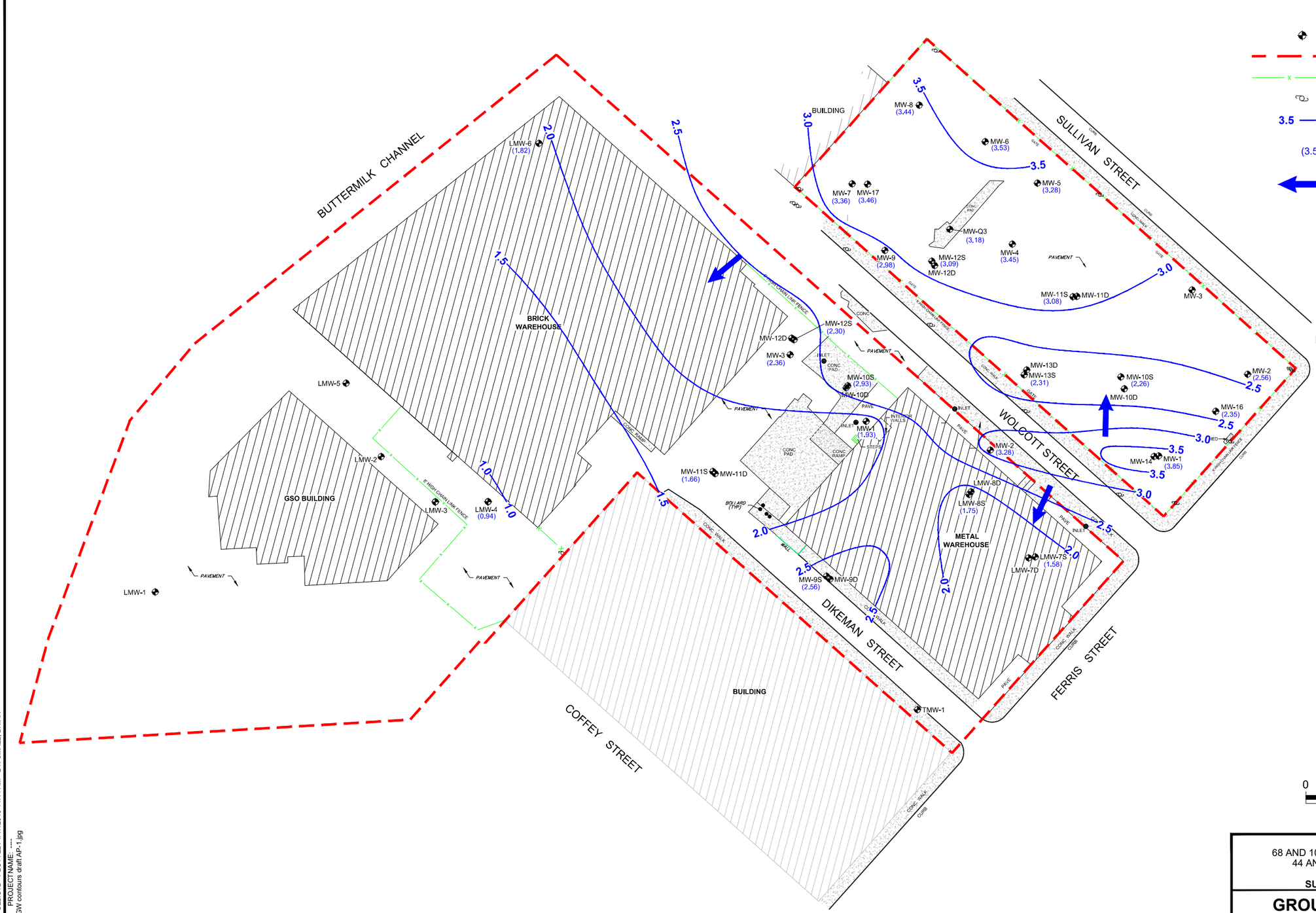
BT RED HOOK, LLC - RED HOOK 3 & 4
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
44 AND 62 FERRIS STREET/219 SULLIVAN STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GROUNDWATER CONTOUR MAP SHALLOW WELLS HIGH TIDE, SEPTEMBER 10, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 15

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\BSmall\OneDrive - ARCADIS\BIM 360 Docs\UNITED PARCEL SERVICE\UPS Red Hook\Red Hook 3\2018\B0038932.0003\01-DWG\SR\Figure 15 - RH3-16-RH4 GWCM-SW HIGH TIDE.dwg LAYOUT: 15 SAVED: 1/17/2019 11:11 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/17/2019 11:14 AM BY: SMALL, BRIAN
XREFS: IMAGES: PROJECTNAME: ----
Red Hook GW contours draft AP-2.jpg



LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- FENCE
- UTILITY POLES
- 3.5 — GROUNDWATER ELEVATION CONTOUR
- (3.53) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. CONTOUR INTERVAL = 0.5 FEET.
4. TIDAL STAGE BASED ON SURFACE WATER ELEVATION.

0 100' 200'

GRAPHIC SCALE

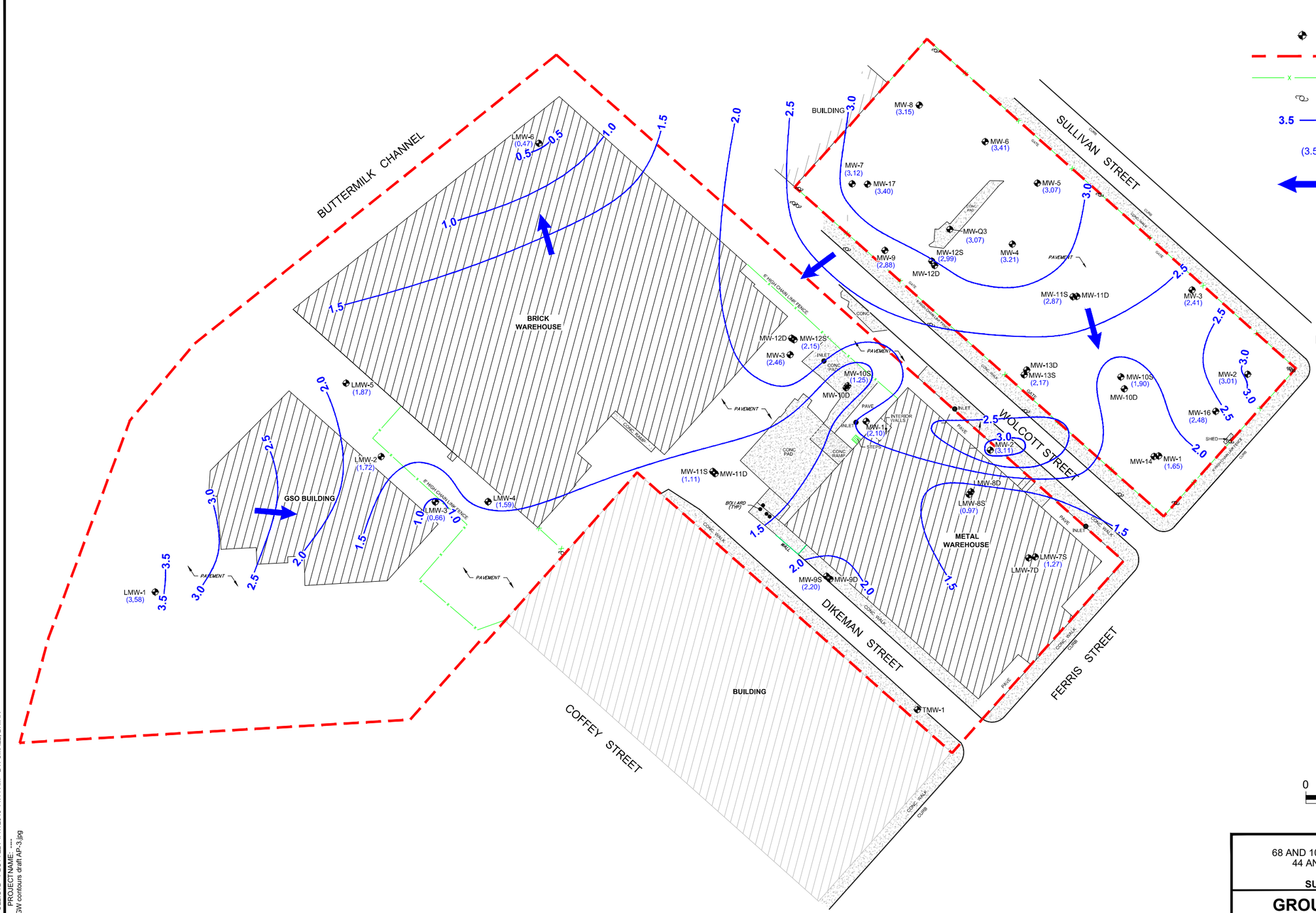
BT RED HOOK, LLC - RED HOOK 3 & 4
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
44 AND 62 FERRIS STREET/219 SULLIVAN STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

GROUNDWATER CONTOUR MAP SHALLOW WELLS MID-TIDAL CYCLE, SEPTEMBER 12, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 16

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\BSmall\OneDrive - ARCADIS\BIM 360 Docs\UNITED PARCEL SERVICE\UPS Red Hook\Red Hook 3\2018\B0038932.0003\01-DWG\SR\Figure 16 - RH3-17-RH4 GWCM-SW MID-TIDAL.dwg LAYOUT: 16 SAVED: 1/17/2019 11:11 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/17/2019 11:14 AM BY: SMALL, BRIAN
XREFS: IMAGES: PROJECTNAME: ----
Red Hook GW contours draft AP-1.jpg



LEGEND:

- MONITORING WELL
- SITE BOUNDARY
- FENCE
- UTILITY POLES
- 3.5 GROUNDWATER ELEVATION CONTOUR
- (3.58) GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- GROUNDWATER FLOW DIRECTION

NOTES:

1. MONITORING WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. CONTOUR INTERVAL = 0.5 FEET.

0 100' 200'

GRAPHIC SCALE

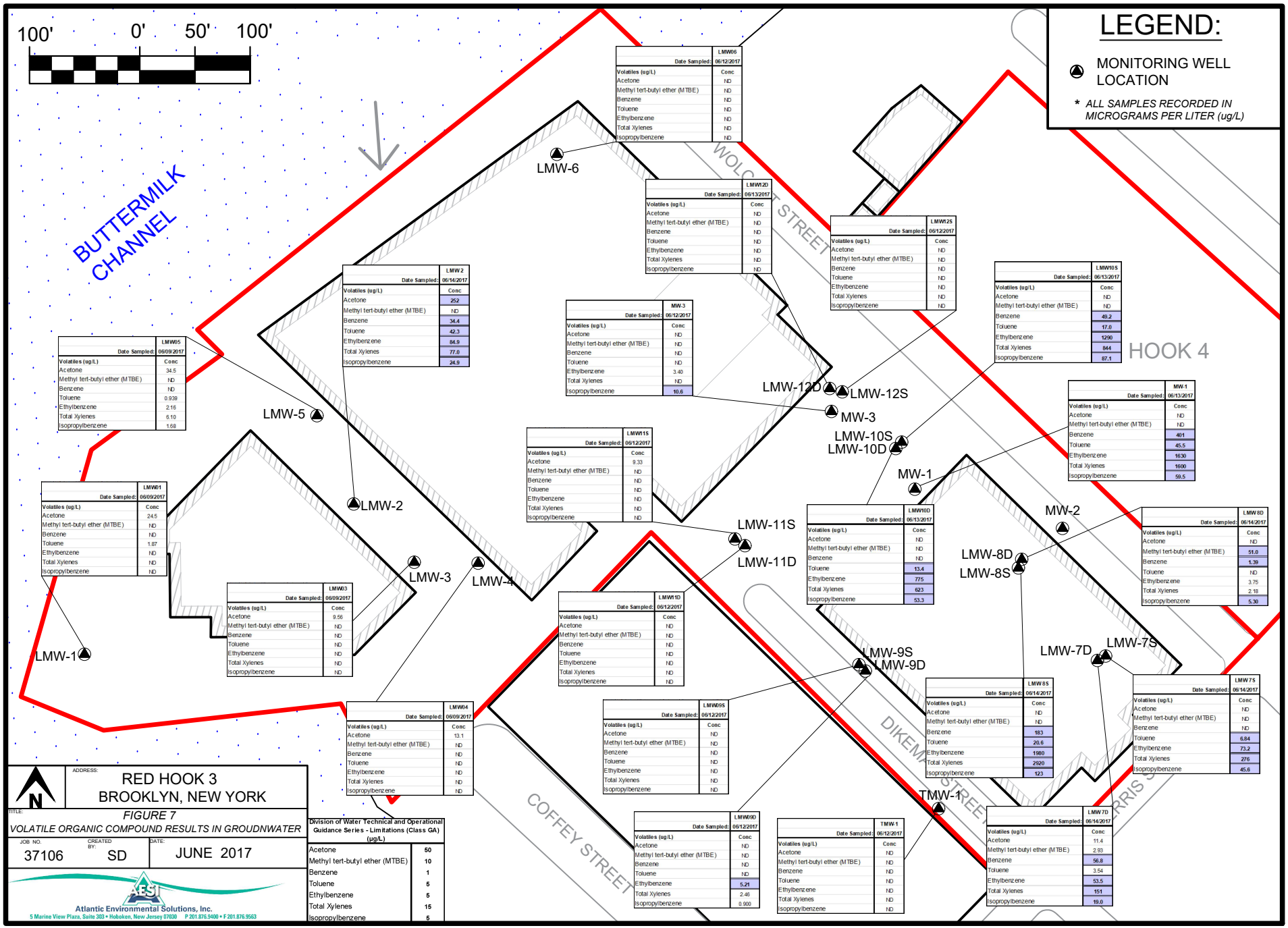
BT RED HOOK, LLC - RED HOOK 3 & 4
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
44 AND 62 FERRIS STREET/219 SULLIVAN STREET
BROOKLYN, NEW YORK
SUPPLEMENTAL REMEDIAL INVESTIGATION

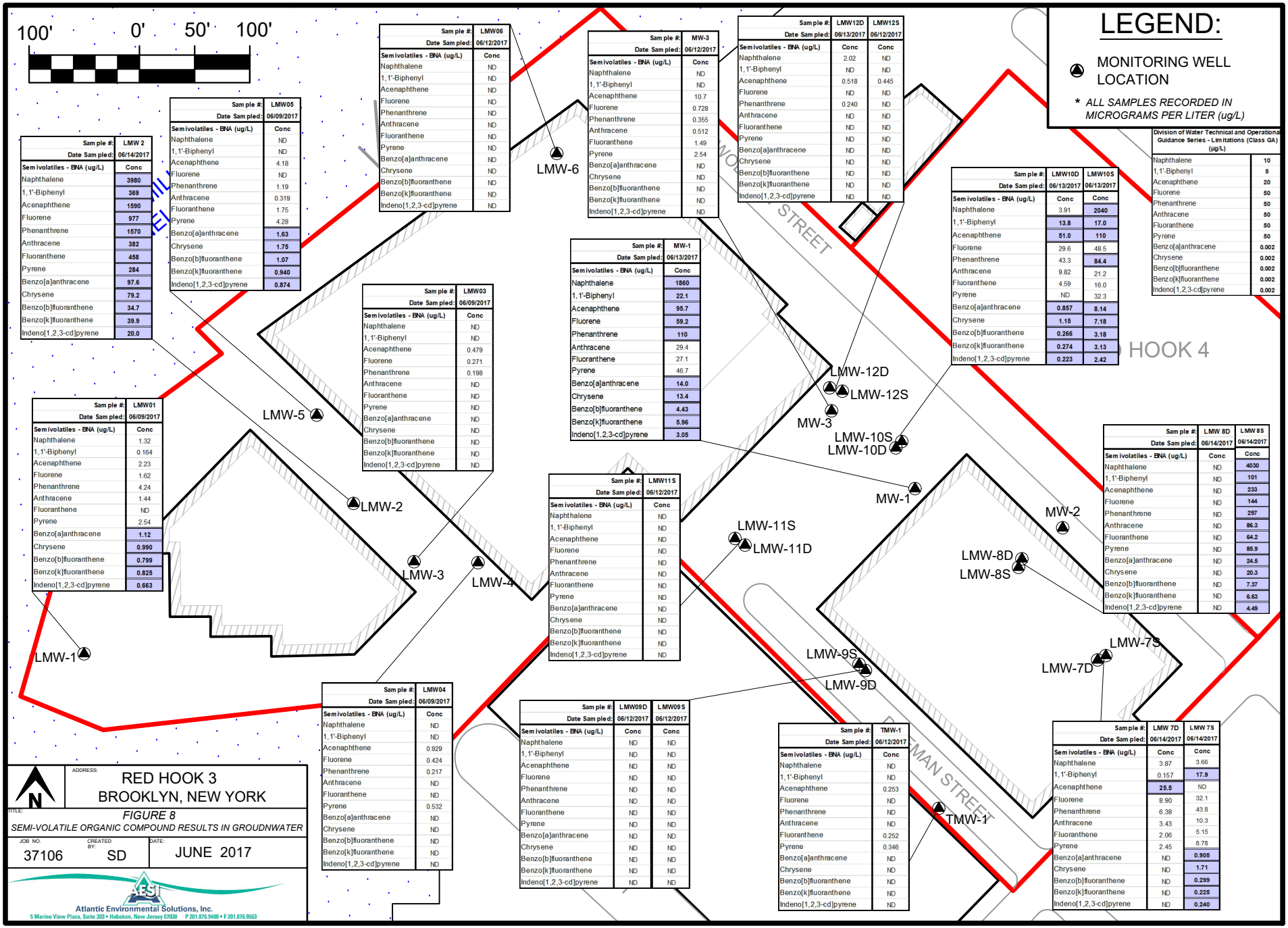
GROUNDWATER CONTOUR MAP SHALLOW WELLS LOW TIDE, SEPTEMBER 10, 2018

ARCADIS Design & Consultancy for natural and built assets

FIGURE 17

CITY:(Reqd) DIV/GROUP:(Reqd) DB:(Reqd) LD:(Opt) PIC:(Opt) PM:(Reqd) TM:(Opt) LYR:(Opt)ON=*;OFF=*REF*
C:\Users\BSmall\OneDrive - ARCADIS\BIM 360 Docs\UNITED PARCEL SERVICE\UPS Red Hook\Red Hook 3\2018\B0038932.0003\01-DWG\SRI\Figure 17 - RH3-18-RH4 GWCM-SW LOW TIDE.dwg LAYOUT: 17 SAVED: 1/17/2019 11:11 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ----
PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 1/17/2019 11:14 AM BY: SMALL, BRIAN
XREFS: IMAGES: PROJECTNAME: ----
Red Hook GW contours draft AP-3.jpg


100' 0' 50' 100'
LEGEND:
MONITORING WELL LOCATION
* ALL SAMPLES RECORDED IN MICROGRAMS PER LITER (ug/L)
BUTTERMILK CHANNEL
WOLCOTT STREET
HOOK 4
DIKEMAN STREET
COFFEY STREET
HARRIS
LMW-6
LMW-5
LMW-2
LMW-1
LMW-3
LMW-4
LMW-12D
LMW-12S
MW-3
LMW-10S
LMW-10D
MW-1
LMW-11S
LMW-11D
MW-2
LMW-8D
LMW-8S
LMW-9S
LMW-9D
LMW-7D
LMW-7S
TMW-1
LMW06 Date Sampled: 06/12/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW12D Date Sampled: 06/13/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW12S Date Sampled: 06/12/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW10S Date Sampled: 06/13/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene 49.2
Toluene 17.0
Ethylbenzene 1290
Total Xylenes 844
Isopropylbenzene 87.1
LMW2 Date Sampled: 06/14/2017
Volatiles (ug/L) Conc
Acetone 252
Methyl tert-butyl ether (MTBE) ND
Benzene 34.4
Toluene 42.3
Ethylbenzene 84.9
Total Xylenes 77.0
Isopropylbenzene 24.9
MW-3 Date Sampled: 06/12/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene 3.40
Total Xylenes ND
Isopropylbenzene 10.6
MW-1 Date Sampled: 06/13/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene 401
Toluene 45.5
Ethylbenzene 1630
Total Xylenes 1600
Isopropylbenzene 59.5
LMW05 Date Sampled: 06/09/2017
Volatiles (ug/L) Conc
Acetone 34.5
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene 0.939
Ethylbenzene 2.16
Total Xylenes 6.10
Isopropylbenzene 1.68
LMW11S Date Sampled: 06/12/2017
Volatiles (ug/L) Conc
Acetone 9.33
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW10D Date Sampled: 06/13/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene 13.4
Ethylbenzene 775
Total Xylenes 623
Isopropylbenzene 53.3
LMW8D Date Sampled: 06/14/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) 51.0
Benzene 1.39
Toluene ND
Ethylbenzene 3.75
Total Xylenes 2.18
Isopropylbenzene 5.30
LMW01 Date Sampled: 06/09/2017
Volatiles (ug/L) Conc
Acetone 24.5
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene 1.87
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW03 Date Sampled: 06/09/2017
Volatiles (ug/L) Conc
Acetone 9.56
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW11D Date Sampled: 06/12/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW04 Date Sampled: 06/09/2017
Volatiles (ug/L) Conc
Acetone 13.1
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW09S Date Sampled: 06/12/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW08S Date Sampled: 06/14/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene 183
Toluene 20.6
Ethylbenzene 1980
Total Xylenes 2920
Isopropylbenzene 123
LMW07S Date Sampled: 06/14/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene 6.84
Ethylbenzene 73.2
Total Xylenes 276
Isopropylbenzene 45.6
LMW09D Date Sampled: 06/12/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene 5.21
Total Xylenes 2.46
Isopropylbenzene 0.900
TMW-1 Date Sampled: 06/12/2017
Volatiles (ug/L) Conc
Acetone ND
Methyl tert-butyl ether (MTBE) ND
Benzene ND
Toluene ND
Ethylbenzene ND
Total Xylenes ND
Isopropylbenzene ND
LMW07D Date Sampled: 06/14/2017
Volatiles (ug/L) Conc
Acetone 11.4
Methyl tert-butyl ether (MTBE) 2.93
Benzene 56.8
Toluene 3.54
Ethylbenzene 53.5
Total Xylenes 151
Isopropylbenzene 19.0
Division of Water Technical and Operational Guidance Series - Limitations (Class GA) (µg/L)
Acetone 50
Methyl tert-butyl ether (MTBE) 10
Benzene 1
Toluene 5
Ethylbenzene 5
Total Xylenes 15
Isopropylbenzene 5
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 7
VOLATILE ORGANIC COMPOUND RESULTS IN GROUNDWATER
JOB NO. 37106
CREATED BY: SD
DATE: JUNE 2017
Atlantic Environmental Solutions, Inc.
5 Marine View Plaza, Suite 303 • Hoboken, New Jersey 07030 P 201.876.9400 • F 201.876.9563



Sample #:	LMW 2
Date Sampled:	06/14/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	3980
1,1'-Biphenyl	369
Acenaphthene	1590
Fluorene	977
Phenanthrene	1570
Anthracene	382
Fluoranthene	458
Pyrene	284
Benzo[a]anthracene	97.6
Chrysene	79.2
Benzo[b]fluoranthene	34.7
Benzo[k]fluoranthene	39.9
Indeno[1,2,3-cd]pyrene	20.0

Sample #:	LMW05
Date Sampled:	06/09/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	ND
1,1'-Biphenyl	ND
Acenaphthene	4.18
Fluorene	ND
Phenanthrene	1.19
Anthracene	0.319
Fluoranthene	1.75
Pyrene	4.28
Benzo[a]anthracene	1.63
Chrysene	1.75
Benzo[b]fluoranthene	1.07
Benzo[k]fluoranthene	0.940
Indeno[1,2,3-cd]pyrene	0.874

Sample #:	LMW06
Date Sampled:	06/12/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	ND
1,1'-Biphenyl	ND
Acenaphthene	ND
Fluorene	ND
Phenanthrene	ND
Anthracene	ND
Fluoranthene	ND
Pyrene	ND
Benzo[a]anthracene	ND
Chrysene	ND
Benzo[b]fluoranthene	ND
Benzo[k]fluoranthene	ND
Indeno[1,2,3-cd]pyrene	ND

Sample #:	MW-3
Date Sampled:	06/12/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	ND
1,1'-Biphenyl	ND
Acenaphthene	10.7
Fluorene	0.728
Phenanthrene	0.355
Anthracene	0.512
Fluoranthene	1.49
Pyrene	2.54
Benzo[a]anthracene	ND
Chrysene	ND
Benzo[b]fluoranthene	ND
Benzo[k]fluoranthene	ND
Indeno[1,2,3-cd]pyrene	ND

Sample #:	LMW12D	LMW12S
Date Sampled:	06/13/2017	06/12/2017
Semivolatiles - BNA (ug/L)	Conc	Conc
Naphthalene	2.02	ND
1,1'-Biphenyl	ND	ND
Acenaphthene	0.518	0.445
Fluorene	ND	ND
Phenanthrene	0.240	ND
Anthracene	ND	ND
Fluoranthene	ND	ND
Pyrene	ND	ND
Benzo[a]anthracene	ND	ND
Chrysene	ND	ND
Benzo[b]fluoranthene	ND	ND
Benzo[k]fluoranthene	ND	ND
Indeno[1,2,3-cd]pyrene	ND	ND

Sample #:	LMW10D	LMW10S
Date Sampled:	06/13/2017	06/13/2017
Semivolatiles - BNA (ug/L)	Conc	Conc
Naphthalene	3.91	2040
1,1'-Biphenyl	13.8	17.0
Acenaphthene	51.0	110
Fluorene	29.6	48.5
Phenanthrene	43.3	84.4
Anthracene	9.82	21.2
Fluoranthene	4.59	16.0
Pyrene	ND	32.3
Benzo[a]anthracene	0.857	8.14
Chrysene	1.15	7.18
Benzo[b]fluoranthene	0.266	3.18
Benzo[k]fluoranthene	0.274	3.13
Indeno[1,2,3-cd]pyrene	0.223	2.42

Division of Water Technical and Operational Guidance Series - Limitations (Class GA) (µg/L)	
Naphthalene	10
1,1'-Biphenyl	5
Acenaphthene	20
Fluorene	50
Phenanthrene	50
Anthracene	50
Fluoranthene	50
Pyrene	50
Benzo[a]anthracene	0.002
Chrysene	0.002
Benzo[b]fluoranthene	0.002
Benzo[k]fluoranthene	0.002
Indeno[1,2,3-cd]pyrene	0.002

Sample #:	LMW01
Date Sampled:	06/09/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	1.32
1,1'-Biphenyl	0.164
Acenaphthene	2.23
Fluorene	1.62
Phenanthrene	4.24
Anthracene	1.44
Fluoranthene	ND
Pyrene	2.54
Benzo[a]anthracene	1.12
Chrysene	0.990
Benzo[b]fluoranthene	0.799
Benzo[k]fluoranthene	0.825
Indeno[1,2,3-cd]pyrene	0.663

Sample #:	LMW03
Date Sampled:	06/09/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	ND
1,1'-Biphenyl	ND
Acenaphthene	0.479
Fluorene	0.271
Phenanthrene	0.198
Anthracene	ND
Fluoranthene	ND
Pyrene	ND
Benzo[a]anthracene	ND
Chrysene	ND
Benzo[b]fluoranthene	ND
Benzo[k]fluoranthene	ND
Indeno[1,2,3-cd]pyrene	ND

Sample #:	MW-1
Date Sampled:	06/13/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	1860
1,1'-Biphenyl	22.1
Acenaphthene	95.7
Fluorene	59.2
Phenanthrene	110
Anthracene	29.4
Fluoranthene	27.1
Pyrene	46.7
Benzo[a]anthracene	14.0
Chrysene	13.4
Benzo[b]fluoranthene	4.43
Benzo[k]fluoranthene	5.96
Indeno[1,2,3-cd]pyrene	3.05

Sample #:	LMW11S
Date Sampled:	06/12/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	ND
1,1'-Biphenyl	ND
Acenaphthene	ND
Fluorene	ND
Phenanthrene	ND
Anthracene	ND
Fluoranthene	ND
Pyrene	ND
Benzo[a]anthracene	ND
Chrysene	ND
Benzo[b]fluoranthene	ND
Benzo[k]fluoranthene	ND
Indeno[1,2,3-cd]pyrene	ND

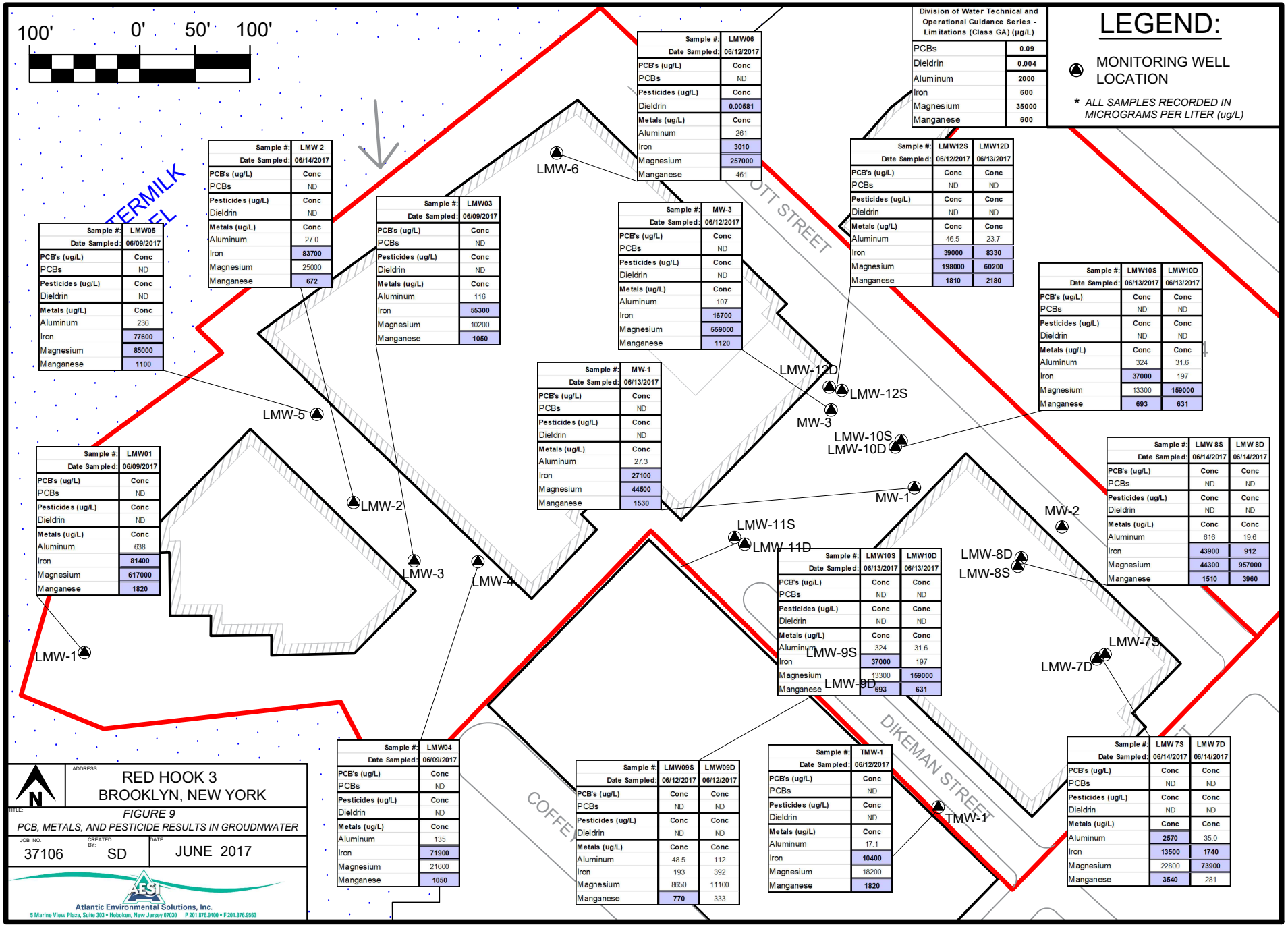
Sample #:	LMW 8D	LMW 8S
Date Sampled:	06/14/2017	06/14/2017
Semivolatiles - BNA (ug/L)	Conc	Conc
Naphthalene	ND	4030
1,1'-Biphenyl	ND	101
Acenaphthene	ND	233
Fluorene	ND	144
Phenanthrene	ND	297
Anthracene	ND	86.3
Fluoranthene	ND	64.2
Pyrene	ND	85.9
Benzo[a]anthracene	ND	24.5
Chrysene	ND	20.3
Benzo[b]fluoranthene	ND	7.37
Benzo[k]fluoranthene	ND	6.63
Indeno[1,2,3-cd]pyrene	ND	4.49

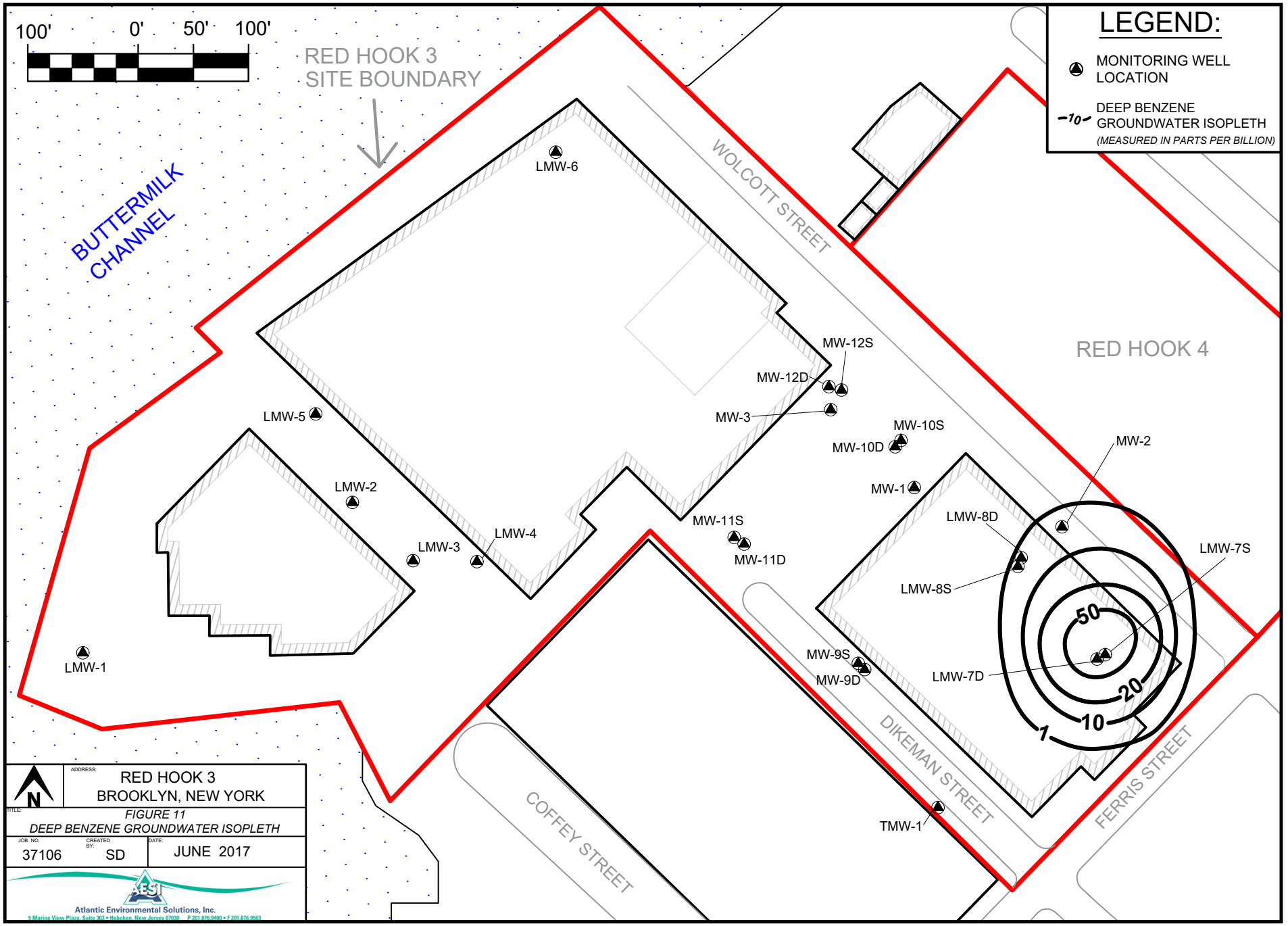
Sample #:	LMW04
Date Sampled:	06/09/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	ND
1,1'-Biphenyl	ND
Acenaphthene	0.929
Fluorene	0.424
Phenanthrene	0.217
Anthracene	ND
Fluoranthene	ND
Pyrene	0.532
Benzo[a]anthracene	ND
Chrysene	ND
Benzo[b]fluoranthene	ND
Benzo[k]fluoranthene	ND
Indeno[1,2,3-cd]pyrene	ND

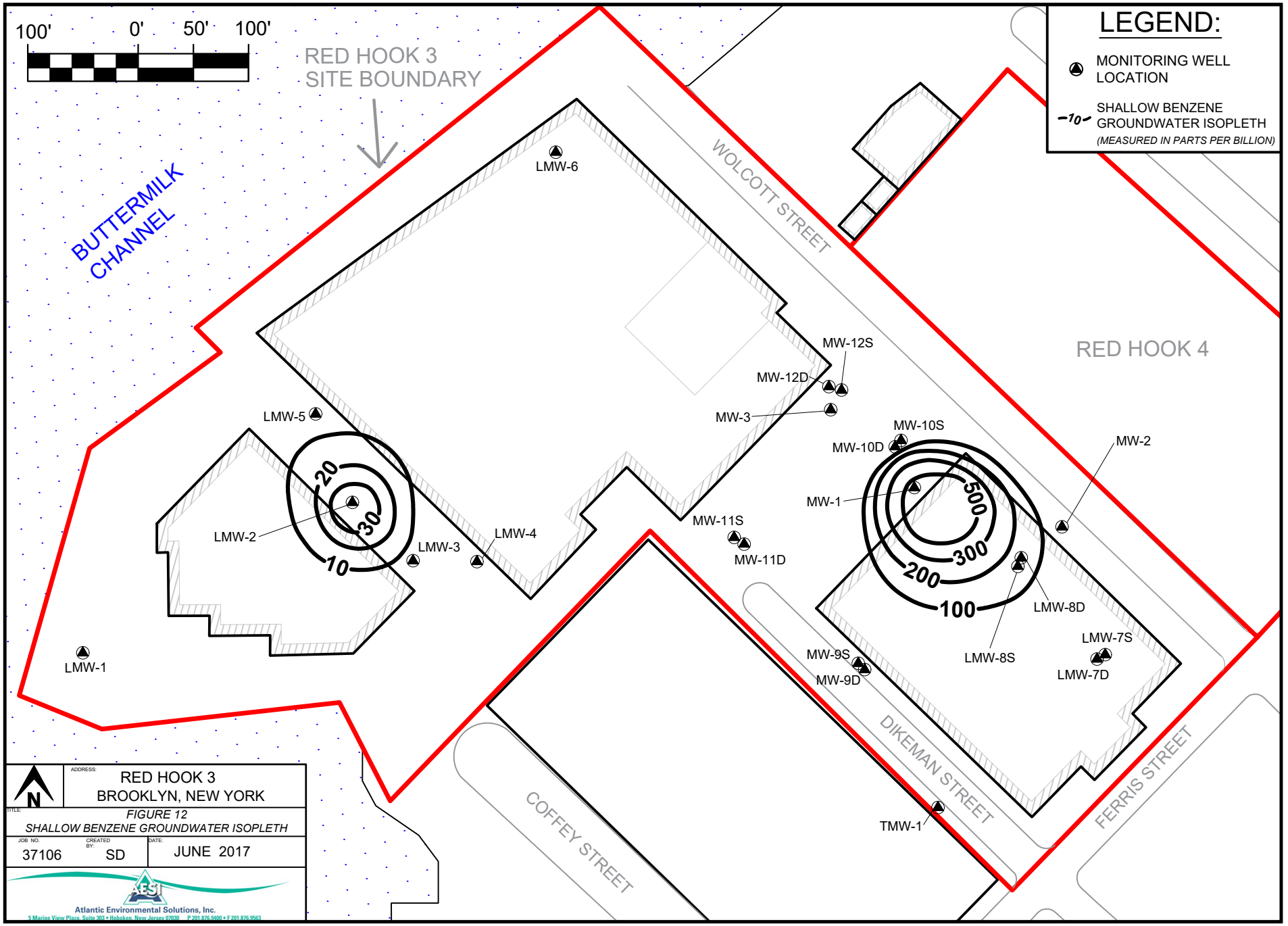
Sample #:	LMW09D	LMW09S
Date Sampled:	06/12/2017	06/12/2017
Semivolatiles - BNA (ug/L)	Conc	Conc
Naphthalene	ND	ND
1,1'-Biphenyl	ND	ND
Acenaphthene	ND	ND
Fluorene	ND	ND
Phenanthrene	ND	ND
Anthracene	ND	ND
Fluoranthene	ND	ND
Pyrene	ND	ND
Benzo[a]anthracene	ND	ND
Chrysene	ND	ND
Benzo[b]fluoranthene	ND	ND
Benzo[k]fluoranthene	ND	ND
Indeno[1,2,3-cd]pyrene	ND	ND

Sample #:	TMW-1
Date Sampled:	06/12/2017
Semivolatiles - BNA (ug/L)	Conc
Naphthalene	ND
1,1'-Biphenyl	ND
Acenaphthene	0.253
Fluorene	ND
Phenanthrene	ND
Anthracene	ND
Fluoranthene	0.252
Pyrene	0.346
Benzo[a]anthracene	ND
Chrysene	ND
Benzo[b]fluoranthene	ND
Benzo[k]fluoranthene	ND
Indeno[1,2,3-cd]pyrene	ND

Sample #:	LMW 7D	LMW 7S
Date Sampled:	06/14/2017	06/14/2017
Semivolatiles - BNA (ug/L)	Conc	Conc
Naphthalene	3.87	3.66
1,1'-Biphenyl	0.157	17.9
Acenaphthene	25.5	ND
Fluorene	8.90	32.1
Phenanthrene	6.38	43.8
Anthracene	3.43	10.3
Fluoranthene	2.06	5.15
Pyrene	2.45	8.78
Benzo[a]anthracene	ND	0.905
Chrysene	ND	1.71
Benzo[b]fluoranthene	ND	0.299
Benzo[k]fluoranthene	ND	0.225
Indeno[1,2,3-cd]pyrene	ND	0.240


100' 0' 50' 100'
LEGEND:
MONITORING WELL LOCATION
* ALL SAMPLES RECORDED IN MICROGRAMS PER LITER (ug/L)
Division of Water Technical and Operational Guidance Series - Limitations (Class GA) (µg/L)
PCBs 0.09
Dieldrin 0.004
Aluminum 2000
Iron 600
Magnesium 35000
Manganese 600
Sample #: LMW05 | Date Sampled: 06/09/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin ND
Metals (ug/L) Conc: Aluminum 236; Iron 77600; Magnesium 85000; Manganese 1100
Sample #: LMW 2 | Date Sampled: 06/14/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin ND
Metals (ug/L) Conc: Aluminum 27.0; Iron 83700; Magnesium 25000; Manganese 672
Sample #: LMW03 | Date Sampled: 06/09/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin ND
Metals (ug/L) Conc: Aluminum 116; Iron 55300; Magnesium 10200; Manganese 1050
Sample #: LMW06 | Date Sampled: 06/12/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin 0.00581
Metals (ug/L) Conc: Aluminum 261; Iron 3010; Magnesium 257000; Manganese 461
Sample #: MW-3 | Date Sampled: 06/12/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin ND
Metals (ug/L) Conc: Aluminum 107; Iron 16700; Magnesium 559000; Manganese 1120
Sample #: LMW12S | LMW12D | Date Sampled: 06/12/2017 | 06/13/2017
PCB's (ug/L): PCBs ND | ND
Pesticides (ug/L): Dieldrin ND | ND
Metals (ug/L): Aluminum 46.5 | 23.7; Iron 39000 | 8330; Magnesium 198000 | 60200; Manganese 1810 | 2180
Sample #: LMW10S | LMW10D | Date Sampled: 06/13/2017 | 06/13/2017
PCB's (ug/L): PCBs ND | ND
Pesticides (ug/L): Dieldrin ND | ND
Metals (ug/L): Aluminum 324 | 31.6; Iron 37000 | 197; Magnesium 13300 | 159000; Manganese 693 | 631
Sample #: MW-1 | Date Sampled: 06/13/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin ND
Metals (ug/L) Conc: Aluminum 27.3; Iron 27100; Magnesium 44500; Manganese 1530
Sample #: LMW01 | Date Sampled: 06/09/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin ND
Metals (ug/L) Conc: Aluminum 638; Iron 81400; Magnesium 617000; Manganese 1820
Sample #: LMW10S | LMW10D | Date Sampled: 06/13/2017 | 06/13/2017
PCB's (ug/L): PCBs ND | ND
Pesticides (ug/L): Dieldrin ND | ND
Metals (ug/L): Aluminum 324 | 31.6; Iron 37000 | 197; Magnesium 13300 | 159000; Manganese 693 | 631
Sample #: LMW 8S | LMW 8D | Date Sampled: 06/14/2017 | 06/14/2017
PCB's (ug/L): PCBs ND | ND
Pesticides (ug/L): Dieldrin ND | ND
Metals (ug/L): Aluminum 616 | 19.6; Iron 43900 | 912; Magnesium 44300 | 957000; Manganese 1510 | 3960
Sample #: LMW04 | Date Sampled: 06/09/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin ND
Metals (ug/L) Conc: Aluminum 135; Iron 71900; Magnesium 21600; Manganese 1050
Sample #: LMW09S | LMW09D | Date Sampled: 06/12/2017 | 06/12/2017
PCB's (ug/L): PCBs ND | ND
Pesticides (ug/L): Dieldrin ND | ND
Metals (ug/L): Aluminum 48.5 | 112; Iron 193 | 392; Magnesium 8650 | 11100; Manganese 770 | 333
Sample #: TMW-1 | Date Sampled: 06/12/2017
PCB's (ug/L) Conc: PCBs ND
Pesticides (ug/L) Conc: Dieldrin ND
Metals (ug/L) Conc: Aluminum 17.1; Iron 10400; Magnesium 18200; Manganese 1820
Sample #: LMW 7S | LMW 7D | Date Sampled: 06/14/2017 | 06/14/2017
PCB's (ug/L): PCBs ND | ND
Pesticides (ug/L): Dieldrin ND | ND
Metals (ug/L): Aluminum 2570 | 35.0; Iron 13500 | 1740; Magnesium 22800 | 73900; Manganese 3540 | 281
LMW-1
LMW-2
LMW-3
LMW-4
LMW-5
LMW-6
LMW-7D
LMW-7S
LMW-8D
LMW-8S
LMW-9D
LMW-9S
LMW-10D
LMW-10S
LMW-11D
LMW-11S
LMW-12D
LMW-12S
MW-1
MW-2
MW-3
TMW-1
BUTT STREET
DIKEMAN STREET
BUTTERMILK CHANNEL
COFFEY
ADDRESS: RED HOOK 3 BROOKLYN, NEW YORK
TITLE: FIGURE 9
PCB, METALS, AND PESTICIDE RESULTS IN GROUDNWATER
JOB NO. 37106
CREATED BY: SD
DATE: JUNE 2017
Atlantic Environmental Solutions, Inc.
5 Marine View Plaza, Suite 303 • Hoboken, New Jersey 07030 P 201.876.5400 • F 201.876.9563


100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
LEGEND:
MONITORING WELL LOCATION
DEEP BENZENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-6
LMW-5
LMW-2
LMW-3
LMW-4
LMW-1
MW-12S
MW-12D
MW-3
MW-10S
MW-10D
MW-1
MW-11S
MW-11D
MW-2
LMW-8D
LMW-8S
LMW-7S
MW-9S
MW-9D
LMW-7D
50
20
10
1
TMW-1
COFFEY STREET
DIKEMAN STREET
FERRIS STREET
N
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 11
DEEP BENZENE GROUNDWATER ISOPLETH
JOB NO.
37106
CREATED BY:
SD
DATE:
JUNE 2017
AESI
Atlantic Environmental Solutions, Inc.
5 Marine View Plaza, Suite 303 • Hoboken, New Jersey 07030 P 201.876.9400 • F 201.876.9563


100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
DIKEMAN STREET
COFFEY STREET
FERRIS STREET
LEGEND:
MONITORING WELL LOCATION
SHALLOW BENZENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-6
LMW-5
LMW-2
LMW-3
LMW-4
LMW-1
MW-12S
MW-12D
MW-3
MW-10S
MW-10D
MW-1
MW-2
MW-11S
MW-11D
MW-8D
MW-8S
MW-7S
MW-7D
MW-9S
MW-9D
TMW-1
20
30
10
500
300
200
100
ADDRESS: RED HOOK 3
BROOKLYN, NEW YORK
TITLE: FIGURE 12
SHALLOW BENZENE GROUNDWATER ISOPLETH
JOB NO. 37106
CREATED BY: SD
DATE: JUNE 2017
Atlantic Environmental Solutions, Inc.
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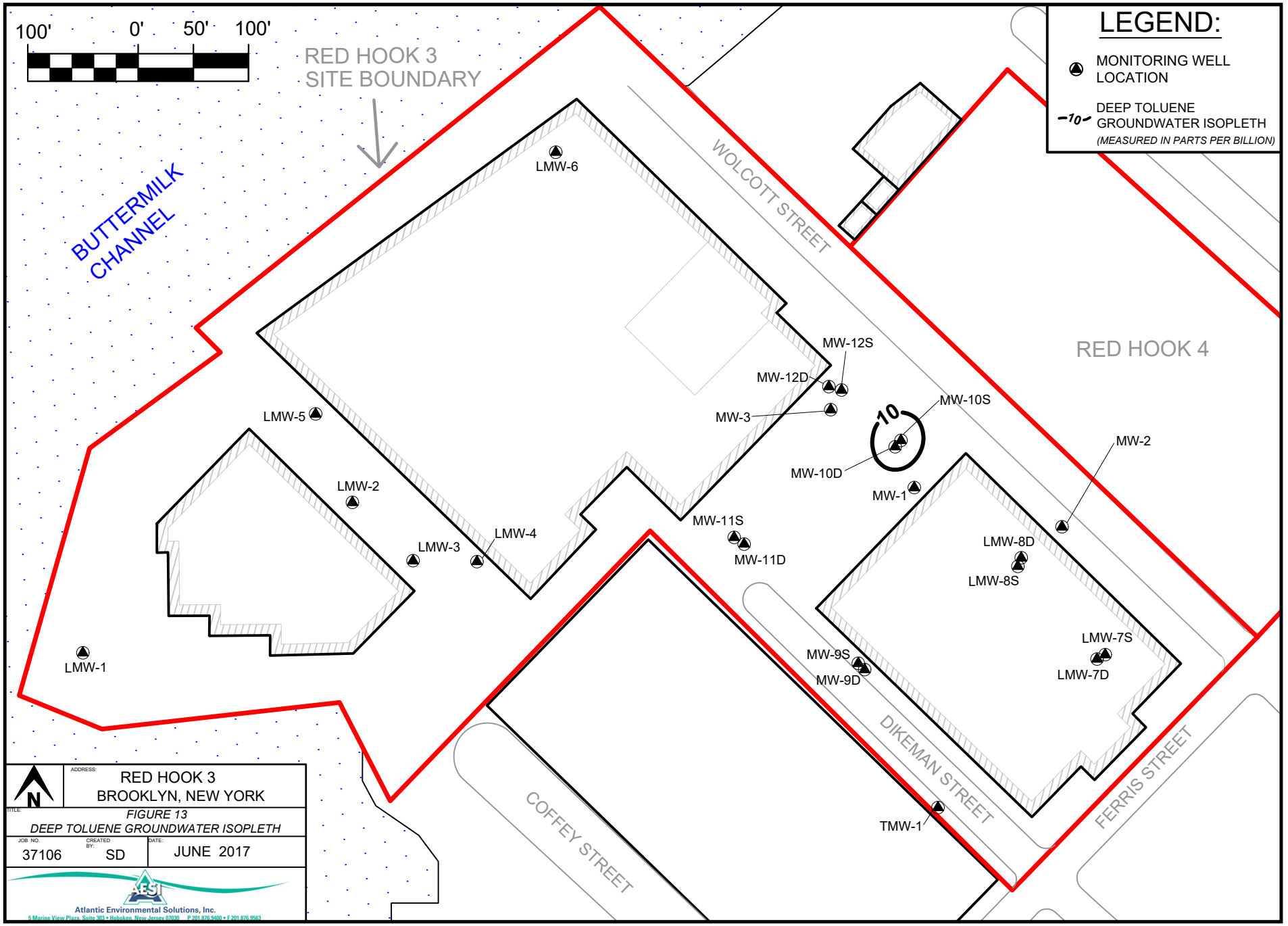
100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
LEGEND:
MONITORING WELL LOCATION
DEEP TOLUENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-6
LMW-5
LMW-2
LMW-3
LMW-4
LMW-1
MW-12S
MW-12D
MW-3
10
MW-10S
MW-10D
MW-1
MW-2
MW-11S
MW-11D
LMW-8D
LMW-8S
LMW-7S
LMW-7D
MW-9S
MW-9D
TMW-1
DIKEMAN STREET
COFFEY STREET
FERRIS STREET
N
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 13
DEEP TOLUENE GROUNDWATER ISOPLETH
JOB NO.
37106
CREATED BY:
SD
DATE:
JUNE 2017
AESI
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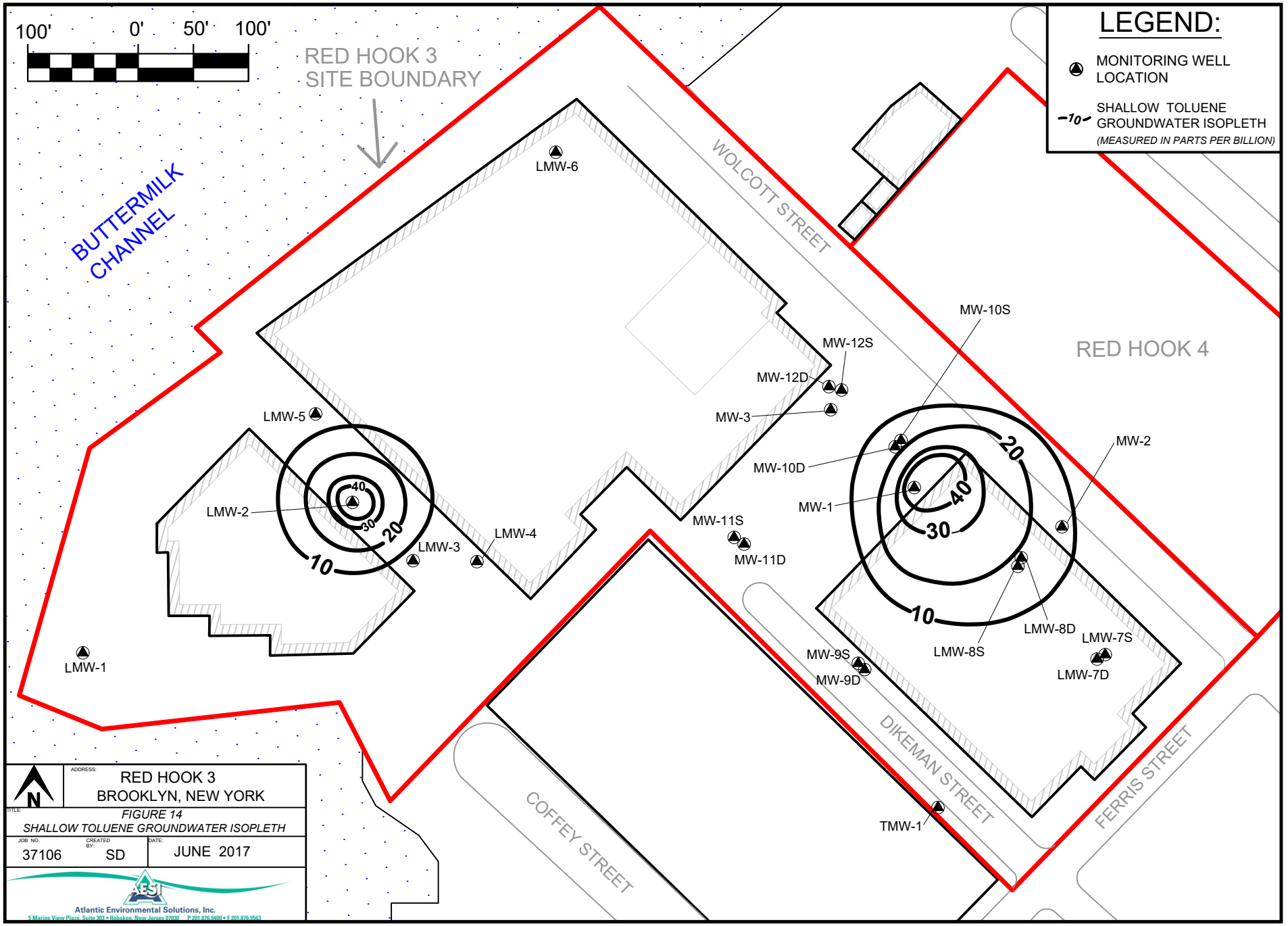
100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
DIKEMAN STREET
COFFEY STREET
FERRIS STREET
LEGEND:
MONITORING WELL LOCATION
SHALLOW TOLUENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-1
LMW-2
LMW-3
LMW-4
LMW-5
LMW-6
MW-1
MW-2
MW-3
MW-7S
MW-7D
MW-8D
MW-8S
MW-9S
MW-9D
MW-10S
MW-10D
MW-11S
MW-11D
MW-12S
MW-12D
TMW-1
10
20
30
40
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 14
SHALLOW TOLUENE GROUNDWATER ISOPLETH
JOB NO.
37106
CREATED BY:
SD
DATE:
JUNE 2017
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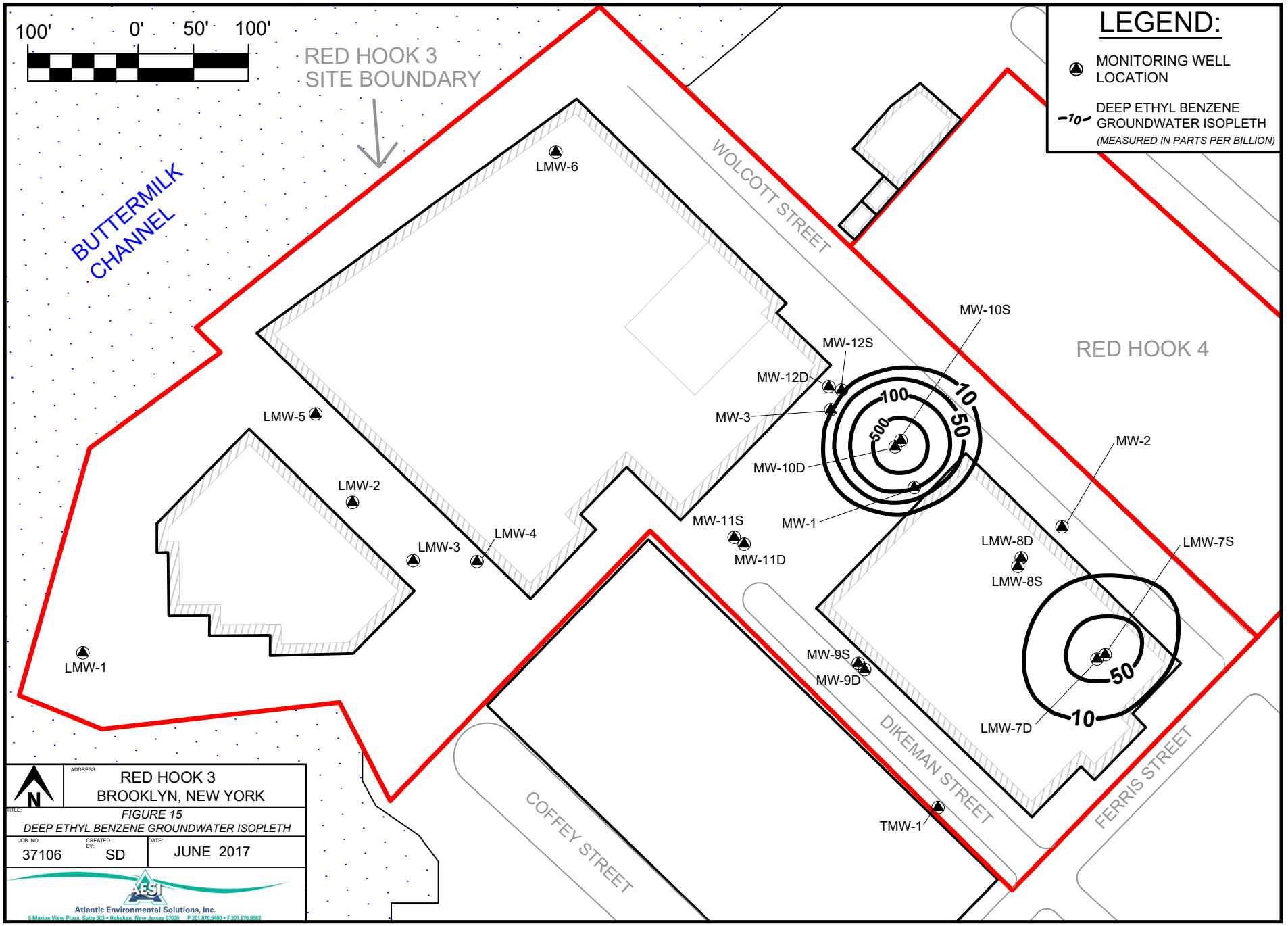
100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
LEGEND:
MONITORING WELL LOCATION
DEEP ETHYL BENZENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-6
LMW-5
LMW-2
LMW-3
LMW-4
LMW-1
MW-10S
MW-12S
MW-12D
MW-3
MW-10D
MW-11S
MW-11D
MW-1
MW-2
LMW-8D
LMW-8S
LMW-7S
MW-9S
MW-9D
LMW-7D
TMW-1
100
10
50
500
50
10
DIKEMAN STREET
COFFEY STREET
FERRIS STREET
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 15
DEEP ETHYL BENZENE GROUNDWATER ISOPLETH
JOB NO.
37106
CREATED BY:
SD
DATE:
JUNE 2017
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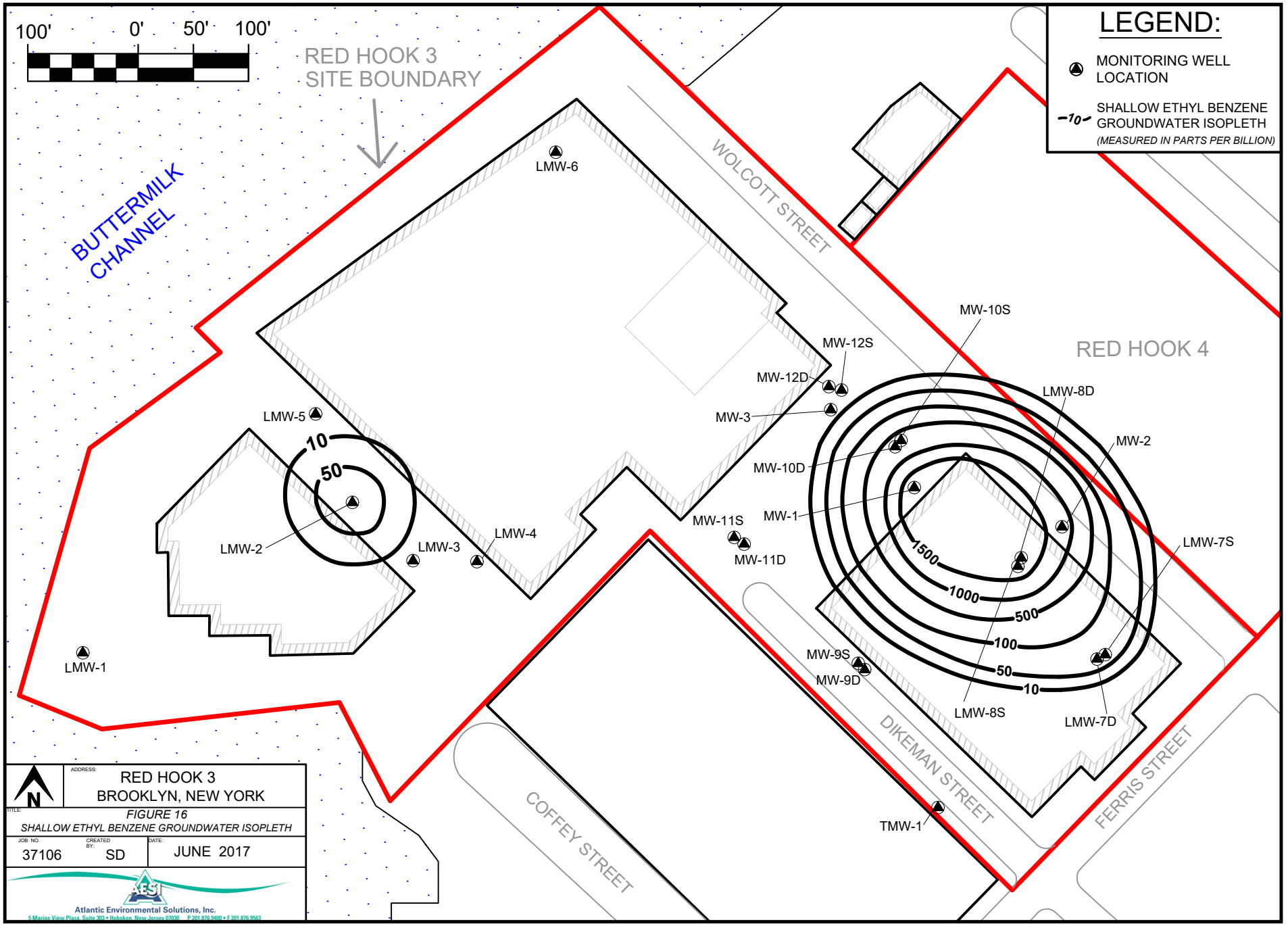
100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
LEGEND:
MONITORING WELL LOCATION
SHALLOW ETHYL BENZENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-6
LMW-5
LMW-2
LMW-3
LMW-4
LMW-1
MW-10S
MW-12S
MW-12D
MW-3
MW-8D
MW-2
MW-10D
MW-1
MW-11S
MW-11D
MW-7S
MW-9S
MW-9D
MW-8S
MW-7D
TMW-1
10
50
1500
1000
500
100
50
10
DIKEMAN STREET
COFFEY STREET
FERRIS STREET
N
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 16
SHALLOW ETHYL BENZENE GROUNDWATER ISOPLETH
JOB NO.
37106
CREATED BY:
SD
DATE:
JUNE 2017
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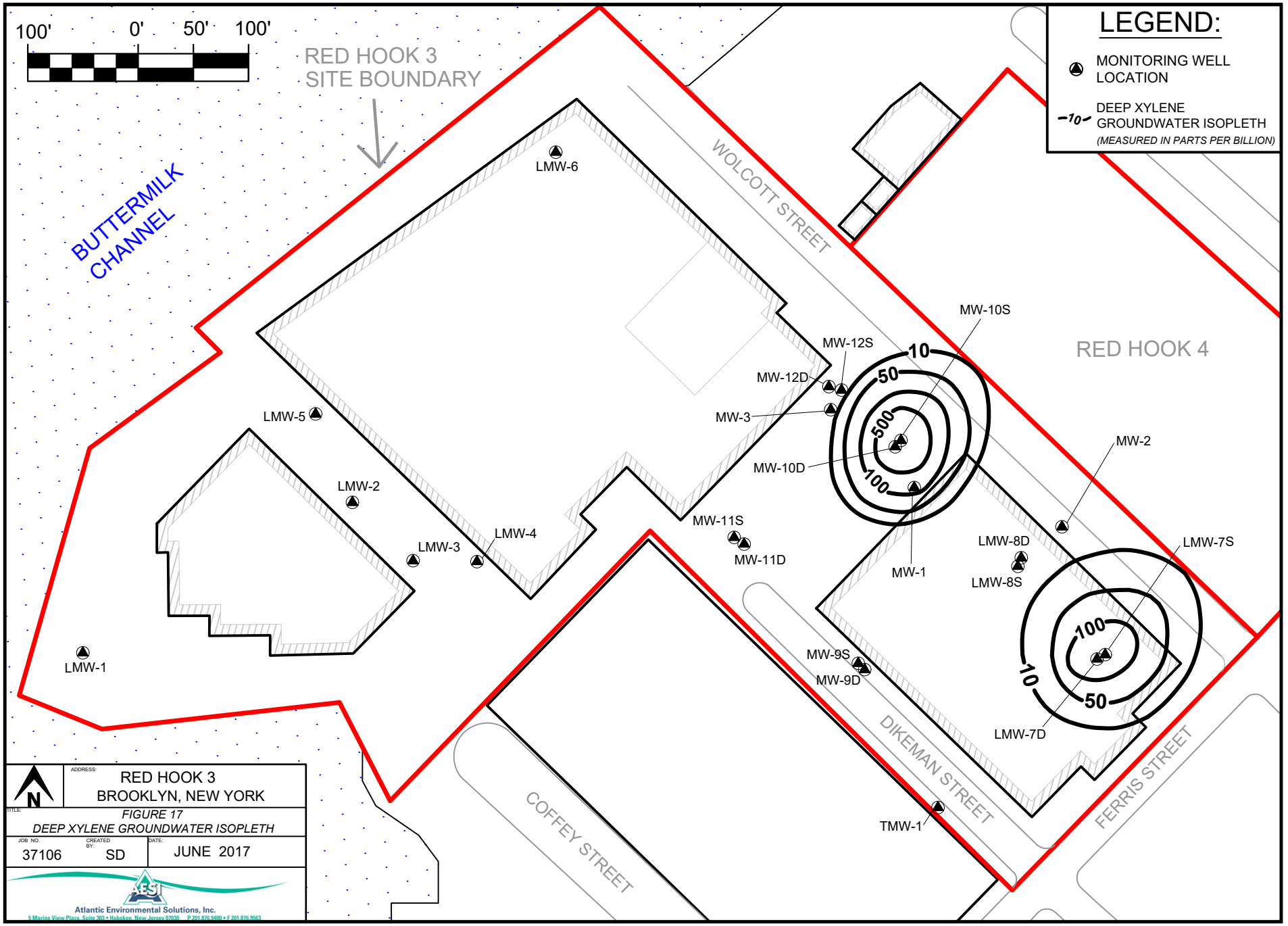
100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
LEGEND:
MONITORING WELL LOCATION
DEEP XYLENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-6
LMW-5
LMW-2
LMW-3
LMW-4
LMW-1
MW-10S
MW-12S
MW-12D
MW-3
MW-10D
MW-11S
MW-11D
MW-1
MW-2
LMW-8D
LMW-8S
LMW-7S
MW-9S
MW-9D
LMW-7D
TMW-1
10
50
500
100
DIKEMAN STREET
COFFEY STREET
FERRIS STREET
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 17
DEEP XYLENE GROUNDWATER ISOPLETH
JOB NO.
37106
CREATED BY:
SD
DATE:
JUNE 2017
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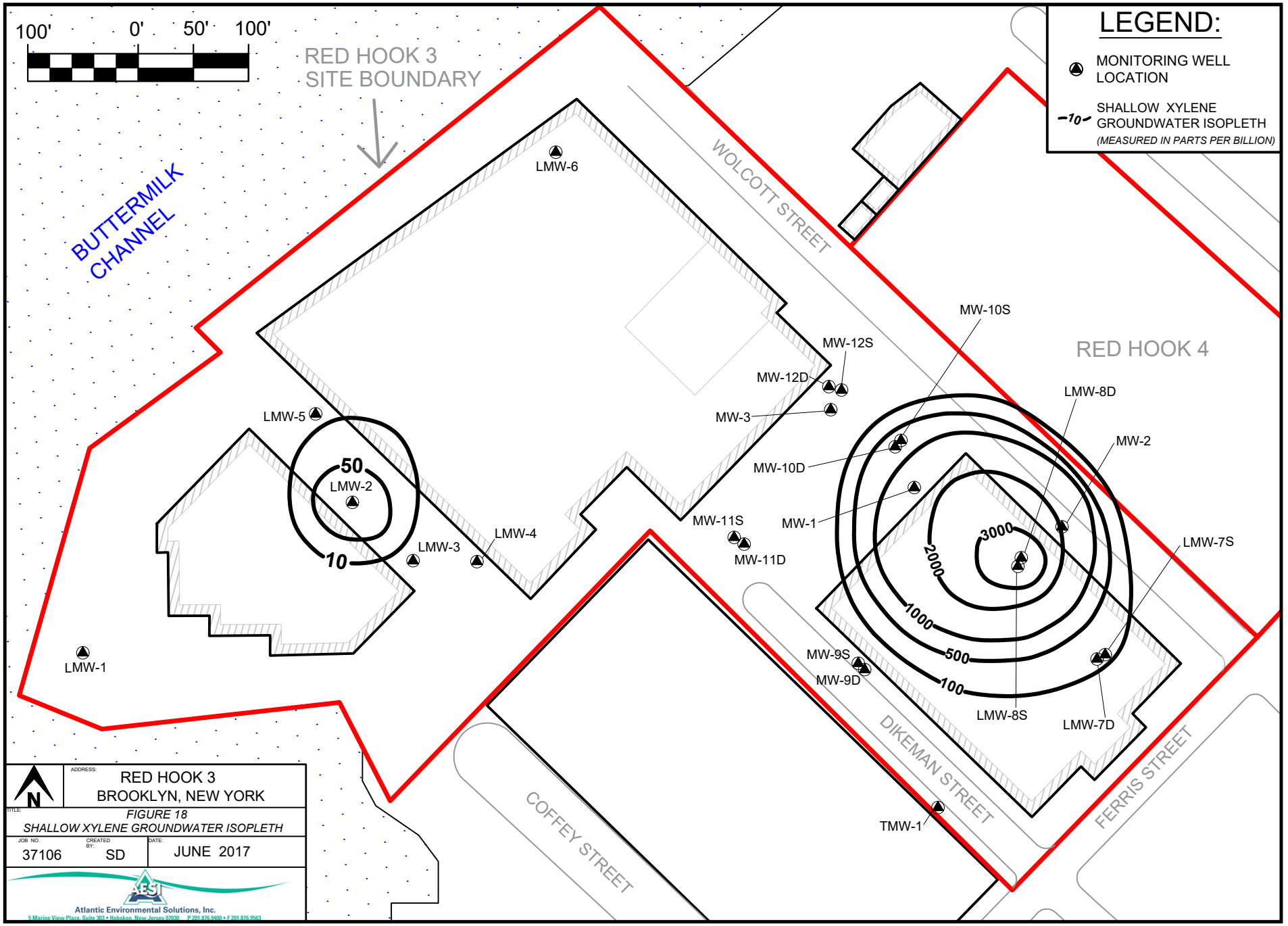
100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
LEGEND:
MONITORING WELL LOCATION
SHALLOW XYLENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-6
LMW-5
LMW-2
LMW-3
LMW-4
LMW-1
50
10
MW-10S
MW-12S
MW-12D
MW-3
MW-8D
MW-2
MW-10D
MW-1
MW-11S
MW-11D
3000
2000
1000
500
100
MW-9S
MW-9D
LMW-8S
LMW-7S
LMW-7D
TMW-1
DIKEMAN STREET
COFFEY STREET
FERRIS STREET
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 18
SHALLOW XYLENE GROUNDWATER ISOPLETH
JOB NO.
37106
CREATED BY:
SD
DATE:
JUNE 2017
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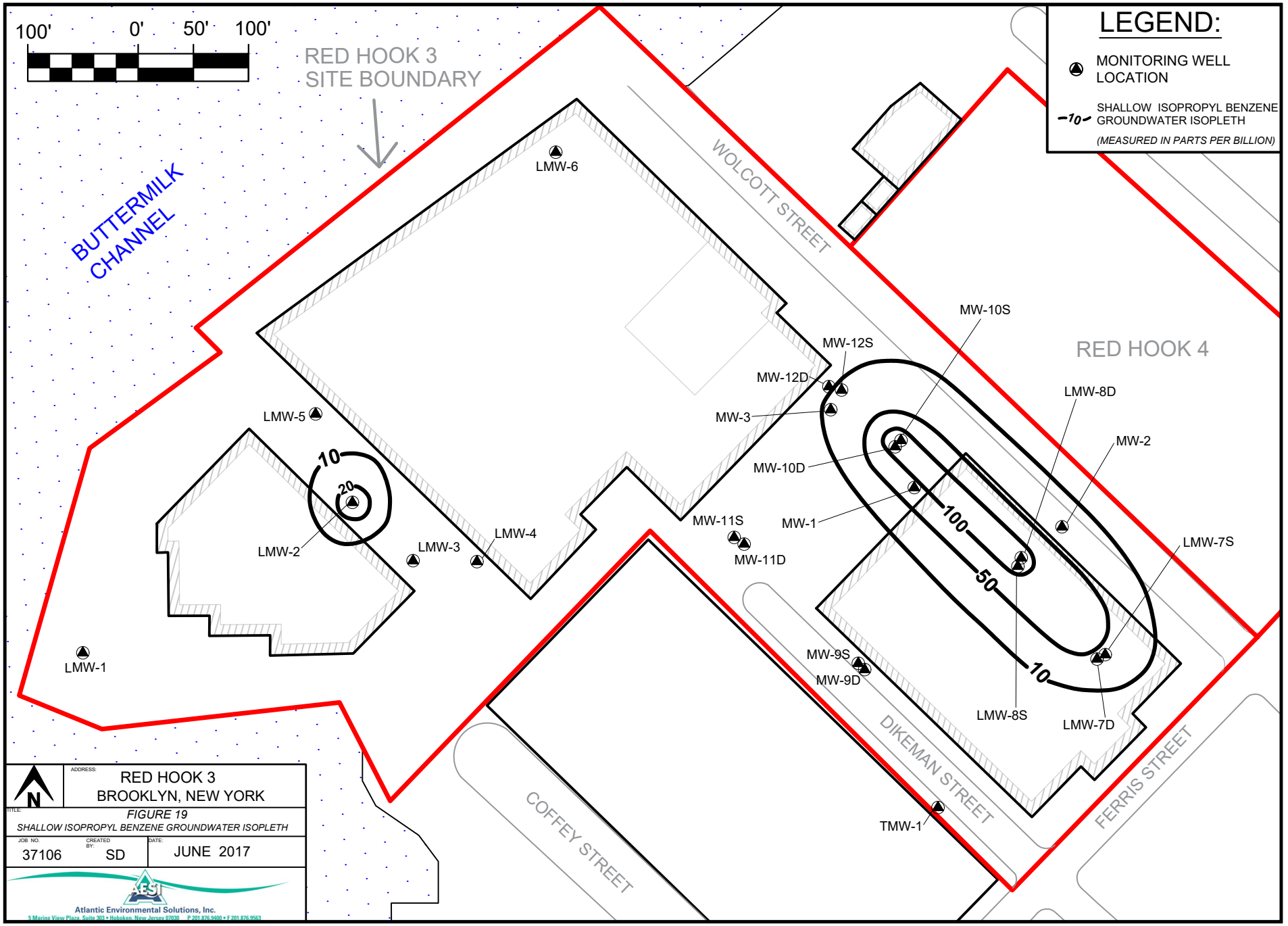

100' 0' 50' 100'
RED HOOK 3
SITE BOUNDARY
BUTTERMILK CHANNEL
WOLCOTT STREET
RED HOOK 4
LEGEND:
MONITORING WELL LOCATION
SHALLOW ISOPROPYL BENZENE GROUNDWATER ISOPLETH
(MEASURED IN PARTS PER BILLION)
LMW-6
LMW-5
LMW-1
LMW-2
LMW-3
LMW-4
MW-10S
MW-12S
MW-12D
MW-3
MW-10D
MW-11S
MW-11D
MW-1
MW-8D
MW-2
LMW-7S
MW-9S
MW-9D
LMW-8S
LMW-7D
TMW-1
10
20
100
50
10
DIKEMAN STREET
COFFEY STREET
FERRIS STREET
N
ADDRESS:
RED HOOK 3
BROOKLYN, NEW YORK
TITLE:
FIGURE 19
SHALLOW ISOPROPYL BENZENE GROUNDWATER ISOPLETH
JOB NO.
37106
CREATED BY:
SD
DATE:
JUNE 2017
AESI
Atlantic Environmental Solutions, Inc.
5 Marine View Plaza, Suite 303 • Hoboken, New Jersey 07030 P 201.876.9400 • F 201.876.9563

APPENDIX B

Project Correspondence

From:	Heller, Chris O (DEC)
To:	Geraci, Catherine
Cc:	Obrecht, Eric R (DEC); Young, Terry W; Devery, Hugh; Korik, Andrew
Subject:	RE: Red Hook - Proposed Confirmation Soil Borings
Date:	Monday, April 29, 2019 9:11:43 AM
Attachments:	RH3 proposed confirmation soil borings.pdf RH4 proposed confirmation soil borings.pdf

Cathy,

Based on the figures that Andy submitted on Friday, we would like to add a minimum 3 additional soil borings based on the results of the soil borings. Attached are figures for both Red hook 3 and 4 where we would like those additional soil borings to be generally located.

The additional soil borings on Red Hook 3 would be located on the southeastern border of the of the proposed parking lot excavation. Due to the close proximity of the monitoring wells and borings where NAPL was identified and the proposed excavation boundary, we would like to ensure that there is no NAPL source material extending outside that boundary.

The additional soil boring on Red Hook 4 would be located on the northern edge of the larger proposed excavation area. Based on the figures provided there was 2 soil borings previously installed by either AESI or Langan but not surveyed by ARCADIS. Based on the soil borings provided by ARCADIS in the SRIR, NAPL was identified in boring A-RH4-DB16 at 6-8 feet. This boring is the closest surveyed soil boring to the additional request confirmation boring.

The terminal depth that would be required for Red Hook 4 would be 20 feet. The depth of the proposed excavations are 15 feet, so having boring depths to 20 feet would ensure that the proposed limits would address all of the source NAPL.

Please let me know if you have any questions.

Chris

From: Geraci, Catherine <Catherine.Geraci@arcadis.com>
Sent: Friday, April 26, 2019 1:26 PM
To: Heller, Chris O (DEC) <Chris.Heller@dec.ny.gov>
Cc: Obrecht, Eric R (DEC) <eric.obrecht@dec.ny.gov>; Young, Terry W <Terry.Young2@arcadis.com>; Devery, Hugh <Hugh.Devery@arcadis.com>; Korik, Andrew <Andrew.Korik@arcadis.com>
Subject: Red Hook - Proposed Confirmation Soil Borings
Importance: High

Hi Chris,

Many thanks to you and Eric for meeting with Terry and me yesterday. We felt that the meeting was very helpful, and appreciate your time and support on these projects.

Based on our discussions, Arcadis understands that NYSDEC, with NYSDOH, will provide a comment letter regarding the Draft IRM Design Work Plans for the Red Hook 3 (RH3) and Red Hook 4 (RH4) Sites next week. We further understand that the major NYSDEC comment is installation of additional borings to confirm the proposed IRM excavation limits (both horizontal and vertical) identified in the draft work plans.

Because of the fast-tracked Red Hook project schedules and given that a direct-push drill rig is currently on-site, we are addressing this NYSDEC comment in advance of receiving the comment letter. As requested during the meeting, provided below is the proposed approach for the confirmation soil borings based on the details discussed during our meeting. Please note that Andy Korik will be providing the two referenced figures shortly, in a separate email.

1. The objective of the confirmation borings will be to confirm the absence/presence of NAPL-saturated source material along the proposed excavation limits identified in the Draft IRM Design Work Plans. No laboratory analytical data are necessary.

2. Excavation horizontal limits will be confirmed based on visual observations made from soil borings installed 30' on center. The 30' on center confirmation soil borings will include new borings and existing borings located along the proposed excavation limits, except where installation of borings and/or horizontal excavation advancement would not occur (e.g., active utilities, site boundaries, etc.). See Figures 1 (RH3) and Figure 2 (RH4) for the proposed additional soil boring locations (figures to be provided in a separate email from Andy Korik). These figures also show existing soil boring locations, including those drilled as part of the two recent waste characterization sampling events required for off-site soil treatment/disposal. All waste characterization soil borings were drilled to 15' bgs, except within the proposed excavation area inside the Metal Warehouse – those borings were drilled to 20' bgs, except for two borings where refusal was encountered at 12' bgs.

3. Step-out confirmation soil borings will be drilled, as necessary, based on observations (if any) of NAPL-saturated source material.

4. No confirmation soil borings are proposed for the RH4 excavation area located along Sullivan Street because 16 waste characterization soil borings have been drilled in this area, primarily to meet the requirements provided by the disposal facilities to delineate D008 (lead) material, and NAPL was not observed in any of the borings drilled along the proposed excavation limits.

5. Excavation vertical limits identified in the Draft IRM Design Work Plans are 15 feet below ground surface (bgs) for all excavation areas, except for the one below the existing metal warehouse on RH3 which is proposed to be 20 feet bgs because it is higher than surrounding grade. Based on our meeting, we understand that the proposed excavation depths need to be confirmed by advancing RH3 borings to 30' bgs, and RH4 borings to 15' or perhaps 20' bgs. We kindly request that NYSDEC identify the terminal boring depth required for RH4.

6. RH3 Potential Excavation Areas Near Former GSO Building - As presented in the RH3 Draft IRM Design Work Plan, two potential excavation areas were identified near the Former GSO Building based on discussions with NYSDEC that occurred prior to and during the Supplemental Remedial Investigation (SRI). Since completion of the SRI, four (4) additional borings have been drilled in each of these potential excavation areas (8 borings total) at locations proximate to the inconclusive SRI observations regarding the presence of NAPL (attached Figure 1). These additional borings were drilled during the recent waste characterization sampling events; the most recent one was completed yesterday (4/25). No NAPL was observed in any of these eight (8) additional borings. As such, and consistent with discussions during yesterday's meeting, excavation of these two areas is not required.

7. The field work associated with the confirmation soil borings will be conducted consistent with the applicable details provided in the NYSDEC-approved SRI Work Plans for these sites. In addition, we plan to provide daily field summary reports to NYSDEC, and then document the findings in a letter report upon completion of the confirmation soil borings.

8. We plan to start the confirmation boring drilling on Monday, April 29.

We trust that this proposal meets your expectations and as noted above in Item 4, please identify the terminal depth required for the RH4 confirmation soil borings.

Please contact me or Andy Korik should you have any questions. Thank you.

Best regards,
Cathy

M. Cathy Geraci| Principal Engineer| Catherine.Geraci@arcadis.com
Arcadis | Arcadis of New York, Inc.
110 West Fayette Street, Suite 300, Syracuse, NY | 13202 | USA
T. +1 315 671 9567 | M. +1 315 882 1529

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau A
625 Broadway, 12th Floor, Albany, NY 12233-7015
P: (518) 402-9625 I F: (518) 402-9627
www.dec.ny.gov

May 24, 2019

Ms. Catherine Geraci
ARCADIS of New York
One Lincoln Center, Suite 300
110 West Fayette Street
Syracuse, New York 13202

Re: IRM Draft Design Work Plan
Red Hook 3 – NYSDEC Brownfield Site #C224213
68 and 100 Ferris Street, 242 and 300 Coffey St.
Brooklyn, Kings County, New York 11231

Dear Ms. Geraci

The New York State Department of Environmental Conservation (the Department) and the New York State Department of Health (NYSDOH) have reviewed the IRM Draft Design Work Plan for the Red Hook 3 Properties site, dated March 2019, which was prepared by ARCADIS of New York on behalf of BT Red Hook LLC. Please revise the report per the following comments and submit for review and approval.

- As discussed in our meeting on 4/25/19, Additional soil borings are to be installed along the proposed excavation boundaries to a depth below the proposed excavation limits to ensure that all the NAPL source material is within these boundaries and defined vertically. Please provide the details of the proposed confirmations soil borings, as well as the figures depicting the locations of these borings. When completed please provide a detailed figure of the surveyed locations and boring logs.

- In section 1.2.4.3 it is mentioned that if buildings were to be constructed on site, it is recommended that vapor mitigation strategies be evaluated. Please mention this potential for vapor mitigation strategies in section 3.2 under engineering controls.

  In section 2.2, in the first bullet paragraph it says NAPL was not observed in the proximate borings, including co-located boring A-RH3-RB2. On figure 4 or 5

there is no boring with the name A-RH3-RB2. The collocated boring with A-RH3-B13 on those figures is A-RB-DB2.

- In section 3.1.1, please include that that the IRM design will be completed in accordance with NYCRR Part 375 in addition to the BCA and DER-10.

- In section 3.1.1.2, the fifth bullet point states “Excavated materials destined for off-site treatment/disposal will be direct-loaded for off-site treatment/disposal, to the extent possible”. Please include a plan for excavated material that can not be directly loaded for offsite treatment and disposal.

- In section 3.1.1.2, please include decontamination procedures that will be implemented during excavation activities.

- In section 3.1.1.2, seventh bullet, please include the community air monitoring plan as an appendix to the document.

- In section 4 please indicate that a Long Island withdrawal permit or permit equivalent will need to be obtained.

- Page 16, second bullet point, 7th line it says, “levees from 1 percent annual chance food”. I believe that it is supposed to be flood instead.

- In section 5.3, please note that a final remedy will be selected for the and will be documented in a remedial action plan and NYSDEC Decision Document.

- From our discussion on 5/1/19, if there is no previously installed discharge point that can be utilized during dewatering activities and a new discharge point needs to be installed, a US Army Corps of Engineers Sections 10 Rivers and Harbors act permit would need to be completed and approved.

As we also discussed on April 25, given that there will be redevelopment activities on-site e.g. building demolition, utility installations, etc., there is potential that onsite workers and the public could encounter and be exposed to contaminated materials during ground intrusive activities. The state will require that an interim site management plan, including a soil excavation and management plan, a plan for evaluating and addressing the potential for soil vapor intrusion, a worker health and safety plan and a community air monitoring plan, be developed and approved in advance of these activities to avoid potential shutdown.

Please make these revisions and resubmit within 30 days of receiving this letter. If you have any questions, feel free to contact me at 518-402-0163 or at chris.heller@dec.ny.gov.

Sincerely,

Chris Heller
Project manager
Remedial Bureau A
Division of Environmental Remediation

Ecc: S. Silfer, UPS
A. Korik, ARCADIS
H. Devery, ARCADIS
E. Obrecht, NYSDEC
J. O'Connell, NYSDEC Region 2
J. Deming / W. Kuehner, NYSDOH

From:	Heller, Chris O (DEC)
To:	Geraci, Catherine
Cc:	Korik, Andrew; Devery, Hugh; Young, Terry W; Obrecht, Eric R (DEC)
Subject:	RE: C224213 & C224214 Red Hook 3 & 4 IRM Draft Design work plan comments and preliminary draft fact sheets
Date:	Friday, May 24, 2019 1:25:30 PM
Attachments:	image002.png image003.png

Cathy,

It will be acceptable to add some additional details regarding management of excavated materials that cannot be directed loaded, decontamination procedures during IRM implementation, and community air monitoring. Full details regarding these topics will need to be provided before any of the IRM excavations could begin. Please let me know if you have any questions.

Chris

From: Geraci, Catherine <Catherine.Geraci@arcadis.com>
Sent: Friday, May 24, 2019 12:16 PM
To: Heller, Chris O (DEC) <Chris.Heller@dec.ny.gov>
Cc: Korik, Andrew <Andrew.Korik@arcadis.com>; Devery, Hugh <Hugh.Devery@arcadis.com>; Young, Terry W <Terry.Young2@arcadis.com>; Obrecht, Eric R (DEC) <eric.obrecht@dec.ny.gov>
Subject: RE: C224213 & C224214 Red Hook 3 & 4 IRM Draft Design work plan comments and preliminary draft fact sheets

Hi Chris,

Thank you for the comment letters. One follow-up question…regarding the comments requesting details/plans regarding management of excavated materials that cannot be directed loaded, decontamination procedures during IRM implementation, and community air monitoring.

Based on our 5/7 telephone conversation, I understood that it was acceptable to add some additional detail regarding each of these topics into the Red Hook 3 and 4 IRM Draft Design Work Plans, but full details including the CAMP, could be in the remedial design submittal to NYSDEC for each Site. Please see attached email and advise – thank you.

Also attached are preliminary draft fact sheets developed using the NYSDEC template that you provided in a previous email.

We very much appreciate NYSDEC's responsiveness to the Red Hook projects.

Please feel free to contact me if you have any questions or something needed.

Thanks,

Cathy

From: Heller, Chris O (DEC) <Chris.Heller@dec.ny.gov>
Sent: Friday, May 24, 2019 9:18 AM
To: Geraci, Catherine <Catherine.Geraci@arcadis.com>
Cc: Korik, Andrew <Andrew.Korik@arcadis.com>; Devery, Hugh <Hugh.Devery@arcadis.com>; Wendy Kuehner <wendy.kuehner@health.ny.gov>; Justin Deming <justin.deming@health.ny.gov>; Obrecht, Eric R (DEC) <eric.obrecht@dec.ny.gov>; sslifer@ups.com; O'Connell, Jane H (DEC) <jane.oconnell@dec.ny.gov>
Subject: C224213 & C224214 Red Hook 3 & 4 IRM Draft Design work plan comments

Cathy,

Attached are the comments letters for the IRM Draft design work plans for both Red Hook 3 & Red Hook 4. Please let me know if you have any questions.

Chris

Chris Heller
Engineer Trainee, Division of Environmental Remediation

New York State Department of Environmental Conservation
625 Broadway 12th Fl, Albany, NY 12233-7015
P: 518-402-0163 | Chris.Heller@dec.ny.gov
www.dec.ny.gov | | |

ARCADIS Design & Consultancy for natural and built assets

Mr. Chris Heller
Project Manager
New York State Department of Environmental Conservation
Remedial Bureau A
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7015

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017
www.arcadis.com

ENVIRONMENT

Subject:
Confirmation Soil Borings
Red Hook 3 – NYSDEC Brownfield Site #C224213
68 and 100 Ferris Street, 242 and 300 Coffey Street
Brooklyn, Kings County, New York 11231

Date:
June 28, 2019

Contact:
Catherine Geraci

Phone:
315.671.9567

Email:
Catherine.Geraci@arcadis.com

Our ref:
B0038994.0003

Dear Mr. Heller:

Pursuant to our meeting on April 25, 2019 and as identified in the Draft Interim Remedial Measure (IRM) Design Work Plan (Work Plan; June 2019) prepared by Arcadis of New York, Inc. (Arcadis), this letter documents the confirmation soil boring program recently completed at the above-reference site. The objective of the program was to confirm the proposed IRM excavation limits identified in the Work Plan by determining the absence/presence of non-aqueous phase liquid (NAPL) saturated source material along the proposed limits.

Horizontal excavation limits for Red Hook 3 were confirmed based on visual observations made from borings (confirmation and previously drilled borings) located approximately 30 feet on center, except where installation of borings and/or horizontal excavation advancement did not occur because of the site boundary parallel to Wolcott Street and the proximate gas line. The terminal depth for the confirmation soil borings was 30 feet below ground surface (bgs), which is 10 to 15 feet deeper than the proposed excavation depths per the New York State Department of Environmental Conservation's (NYSDEC's) request (NYSDEC April 29, 2019 email to Arcadis).

Drilling for the pre-design confirmation soil boring program was completed on May 23, 2019 and the surveyed locations are shown on the figure provided in Attachment 1. As shown on the figure, step-out confirmation soil borings were drilled, as necessary, based on observations of NAPL-saturated source material along some of the proposed excavation limits. The soil boring and photograph

logs for the confirmation soil boring program are provided in Attachments 2 and 3, respectively.

Accordingly, and as discussed during conference call amongst representatives from NYSDEC, the New York State Department of Health and Arcadis, modifications to the Red Hook 3 excavation limits identified in the Work Plan are necessary. Under separate cover, additional information (e.g., figure with Red Hook 3 NAPL intervals identified and geologic cross-sections spanning both Red Hook 3 and Red Hook 4) will be provided to NYSDEC to assist in determining the modified Red Hook 3 IRM excavation boundaries and facilitate our conference call scheduled for July 2, 2019.

BT Red Hook, LLC and Arcadis appreciate the NYSDEC's continued attention to this project and look forward to our conference call. In the interim, if you have any questions, please contact me at (315) 671-9567 or at catherine.geraci@arcadis.com.

Sincerely,

Arcadis of New York, Inc.

M. Cathy Geraci

Cathy Geraci
Principal Environmental Engineer

Copies:
Moniqua Williams, BT Red Hook, LLC
Eric Obrecht, NYSDEC
Terry Young, PE, Arcadis
Hugh Devery, Arcadis
Andrew Korik, Arcadis

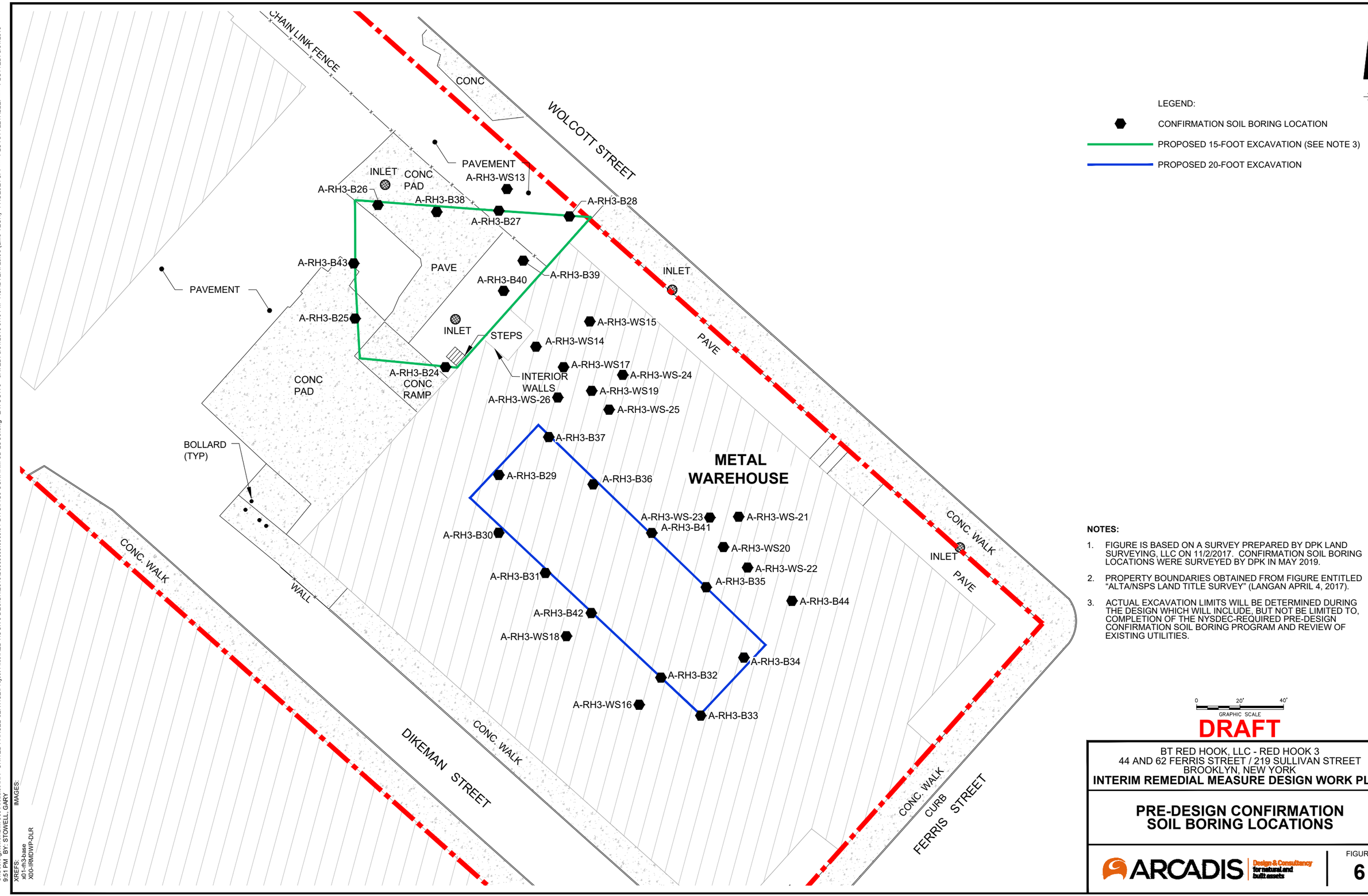
Enclosures:

Attachments

1 Confirmation Soil Boring Locations Figure (from Arcadis' June 2019 Draft IRM Design Work Plan)
2 Confirmation Soil Boring Logs
3 Confirmation Soil Boring Photolog

ATTACHMENT 1

Confirmation Soil Boring Locations Figure
(from Arcadis' June 2019 Draft IRM Design Work Plan)



NOTES:

1. FIGURE IS BASED ON A SURVEY PREPARED BY DPK LAND SURVEYING, LLC ON 11/2/2017. CONFIRMATION SOIL BORING LOCATIONS WERE SURVEYED BY DPK IN MAY 2019.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED "ALTA/NSPS LAND TITLE SURVEY" (LANGAN APRIL 4, 2017).
3. ACTUAL EXCAVATION LIMITS WILL BE DETERMINED DURING THE DESIGN WHICH WILL INCLUDE, BUT NOT BE LIMITED TO, COMPLETION OF THE NYSDEC-REQUIRED PRE-DESIGN CONFIRMATION SOIL BORING PROGRAM AND REVIEW OF EXISTING UTILITIES.

0 20' 40'
GRAPHIC SCALE

DRAFT

BT RED HOOK, LLC - RED HOOK 3
44 AND 62 FERRIS STREET / 219 SULLIVAN STREET
BROOKLYN, NEW YORK
INTERIM REMEDIAL MEASURE DESIGN WORK PLAN

PRE-DESIGN CONFIRMATION SOIL BORING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 6

CITY: SYRACUSE, NY DIV/GROUP: IMDV DB: K.DAVIS LD: K.DAVIS PIC: C.GERACI PM: C.GERACI TM: D.NODINE LYR: ON=*;OFF=*REF*
C:\Users\gstowell\BIM 360\Arcadis\ANA - UNITED PARCEL SERVICE\Project Files\RED HOOK 3 DESIGN\2019\B0038993.0003\01-DWG\FIG6-CONFIRM-SB-LOCS.dwg LAYOUT: 6 SAVED: 5/31/2019 9:40 PM ACADVER: 23.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 5/31/2019
9:51 PM BY: STOWELL, GARY
XREFS:
x01-rh3-base
X00-IRMDWP-DLR
IMAGES:

ATTACHMENT 2

Confirmation Soil Boring Logs

Date Start/Finish: 4/30/19 - 5/3/19	**Northing:** 186838.91	**Well/Boring ID:** **A-RH3-B24**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979591.30	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 9.28' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10								
0 / 5	NA	0-5	NA	10.2 69.5 983.2 1,045 4,496			Hand-cleared from 0-5' bgs. ASPHALT. Brown fine to coarse SAND, some subangular to subrounded Gravel and Pebbles, trace Silt and Concrete fragments, poorly sorted, loose, moist. Subrounded Gravel, odor.	
5 / 0	1	5-10	1.2	0.0 2.3 162.0 139.9 24.2			Little fine to coarse angular Gravel and Brick.	
10 / -5	2	10-15	3.3	145.8 52.5 4.4 0.0 0.0			Dark gray SILT, some fine Sand, trace fine angular Gravel, soft, wet, slight odor, slight iridescent sheen. Red brown very fine to medium SAND, some Clay, trace fine to coarse subangular Gravel, low plasticity, moist.	Boring backfilled to grade with bentonite pellets
15	3	15-20	5.0	2,714			Red brown fine to medium SAND, trace Silt, well sorted, moist, slight odor.	

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

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Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B24

Borehole Depth: 30' bgs

Site Location:

68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	3	15-20	5.0	173.0 44.5 31.1 3.4			Red brown fine to medium SAND, trace Silt, well sorted, moist, slight odor, slight iridescent sheen from 16-19' bgs.	Boring backfilled to grade with bentonite pellets
-10 / 20							Wet.	
	4	20-25	5.0	333.3 392.7 490.7 41.9 160.9			Red brown very fine to fine SAND, well sorted, wet, odor.	
-15 / 25							Slight odor, slight iridescent sheen from 25-27' bgs.	
	5	25-30	5.0	133.9 45.5 30.4 4.4 7.2				
-20 / 30							End of boring at 30' bgs.	
-25 / 35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 4/30/19 - 5/9/19	**Northing:** 186861.23	**Well/Boring ID:** **A-RH3-B25**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979549.74	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 7.58' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0				0.0			Hand-cleared from 0-5' bgs. CONCRETE.	
							Weathered CONCRETE, BRICK, and GRAVEL.	
				0.0			Gray fine to coarse SAND, some fine to coarse subangular Gravel, Brick, and Concrete, dry.	
5	NA	0-5	NA	0.0				
				0.0			Red brown fine to coarse SAND, some Brick and Slag, little fine to coarse subangular Gravel, moist.	
				0.0				
5				0.0			Fine to medium SAND, trace Silt, well sorted, moderately dense, odor.	
				0.0				
0	1	5-10	3.0	49.6			Wet at 7' bgs; staining from 7-12' bgs.	
				92.3				
				299.8				
10				85.6				
				6.3				Boring backfilled to grade with bentonite pellets
-5	2	10-15	3.5	92.0				
				21.1				
				2.6				
15								
	3	15-20	5.0	0.0			Brown very fine to medium SAND, well sorted, dense, wet, iridescent sheen from 15-17' bgs.	

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B25

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-10	3	15-20	5.0	0.0 0.0 0.0 0.0			Brown very fine to medium SAND, well sorted, dense, wet, iridescent sheen from 15-17' bgs.	Boring backfilled to grade with bentonite pellets
20								
	4	20-25	5.0	0.0 0.0 0.0 0.0 0.0			Brown fine to coarse SAND, poorly sorted, wet.	
-15							Brown very fine to fine SAND, well sorted, wet.	
25								
-20	5	25-30	NA	0.0 0.0 0.0 0.0 0.0				
30							End of boring at 30' bgs.	
-25								
35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 4/30/19 - 5/3/19	**Northing:** 186913.36	**Well/Boring ID:** **A-RH3-B26**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979560.23	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 6.90' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 6.9				0.0			Hand-cleared from 0-5' bgs. CONCRETE.	
				0.0			Dark gray brown fine to coarse SAND, little fine to coarse subangular Gravel, trace Silt, moist.	
5 / 1.9	NA	0-5	NA	20.2			Some Gravel, Brick, Slag, and Ash.	
				9.2				
				10.2				
				112.1			Brown SILT, some fine to coarse SAND, soft, moist.	
				19.1			Dark gray fine to coarse SAND, some Silt, Brick, and Ash, poorly sorted, moist.	
0 / 6.9	1	5-10	2.8	142.5			Dark gray brown very fine to fine Silty SAND, soft, wet, slight iridescent sheen, slight odor.	
				462.5				
				30.1				
10 / -3.1				7.5				
-5 / 11.9	2	10-15	5.0	8.1				Boring backfilled to grade with bentonite pellets
				3.9				
				2.5				
				3.5			Gray brown fine to coarse SAND, poorly sorted, wet.	
15 / -8.1	3	15-20	4.6	0.0			Red brown fine to medium SAND, well sorted, wet.	

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B26

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-10	3	15-20	4.6	0.0 0.0 2.0 1.0			Red brown fine to medium SAND, well sorted, wet.	Boring backfilled to grade with bentonite pellets
20							Gray brown fine to coarse SAND, trace fine angular Gravel, poorly sorted, wet.	
-15	4	20-25	4.6	0.0 0.0 0.0 0.0 0.0			Grayish red brown fine to coarse SAND, well sorted, wet.	
25								
-20	5	25-30	5.0	0.0 0.0 0.0 0.0 0.0			Grayish red brown very fine to fine SAND, well sorted, wet.	
30							End of boring at 30' bgs.	
-25								
35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 4/30/19 - 5/3/19	**Northing:** 186907.31	**Well/Boring ID:** **A-RH3-B27**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979615.84	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 8.19' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10								
0 / 10				10.8			Hand-cleared from 0-5' bgs. ASPHALT.	
				6.1			Brown very fine to coarse SAND, some subangular Gravel and Pebbles, extensive Brick fragments throughout, moist.	
	NA	0-5	NA	2.2				
5 / 5				27.8				
				7.8				
5 / 5				51.1			Fine to coarse SAND, some fine to coarse subangular Gravel, Brick, and Slag, trace Silt, moist, slight odor.	
				93.3				
	1	5-10	3.0	810.4			Dark gray brown fine to medium SAND, well sorted, wet, slight odor, some iridescent sheen.	
10 / 0				267.5				
				346.8				
10 / 0				184.4			Dark gray brown very fine to fine SAND, trace Silt, saturated with golden NAPL, wet.	
				150.7				Boring backfilled to grade with bentonite pellets
	2	10-15	5.0	103.7				
15 / -5				32.1			Dark gray SILT, little fine SAND, soft, wet.	
				45.5				
15 / -5	3	15-20	3.2	203.0			Brown CLAY, little fine Sand, high plasticity, wet, some golden NAPL.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B27

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
				44.9			Brown CLAY, little fine Sand, high plasticity, wet, some golden NAPL.	Boring backfilled to grade with bentonite pellets
-10	3	15-20	3.2	66.9				
				43.7			Brown fine to coarse SAND, trace Clay, poorly sorted, wet.	
20				54.4				
				58.7			Gray brown fine to medium SAND, trace coarse rounded Gravel, well sorted, wet.	
				98.5				
	4	20-25	NA	228.3				
-15				152.5				
				96.8				
25				332.9			Brown very fine to fine SAND, well sorted, wet, slight iridescent sheen from 25-27' bgs.	
				261.1				
	5	25-30	NA	34.9				
-20				22.5				
				43.8				
30							End of boring at 30' bgs.	
-25								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 4/30/19 - 5/6/19	**Northing:** 186908.12	**Well/Boring ID:** **A-RH3-B28**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979648.21	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 9.00' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0				0.0			Hand cleared from 0-5' bgs. Dark gray brown fine to coarse SAND, some fine to coarse subangular Gravel, trace Silt, Brick, and Ash, moist.	
				0.0				
	NA	0-5	NA	2.1			Little Gravel, no Ash.	
5				17.8				
				394.3				
5				8.5			Brown fine to coarse SAND, trace fine to coarse Gravel and Brick, poorly sorted, moist.	
				284.8				
	1	5-10	3.2	57.5			Black very fine to fine SAND, well sorted, staining, wet.	
0				231.0				
				169.9				
10				94.5			Black and dark gray very fine to fine SAND, some Silt, wet, odor, slight sheen, black staining.	
				251.1				Boring backfilled to grade with bentonite pellets
	2	10-15	NA	469.1				
				69.9				
-5				103.1			Gray brown fine to medium SAND, well sorted, wet.	
15								
	2	15-20	NA	451.2			Very fine to fine SAND, little Silt, well sorted, saturated, black staining, slight sheen.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B28

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0				536.9			Very fine to fine SAND, little Silt, well sorted, saturated, black staining, slight sheen.	Boring backfilled to grade with bentonite pellets
	3	15-20	5.0	151.6			Gray brown CLAY, trace fine Sand, high plasticity, moderately stiff, moist.	
-10				51.7				
20				56.7			Trace fine angular Gravel.	
				0.0				
				0.0				
	4	20-25	5.0	0.0			Gray brown very fine to medium SAND, well sorted, wet.	
-15				0.0				
25				0.0				
				0.0			Gray brown very fine to fine SAND, trace Silt, well sorted, wet.	
				0.0				
	5	25-30	5.0	0.0				
-20				0.0				
30				0.0				
							End of boring at 30' bgs.	
-25								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/7/19	**Northing:** 186789.36	**Well/Boring ID:** **A-RH3-B29**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979615.77	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.50' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand-cleared from 0-5' bgs. CONCRETE. Dark brown to very dark gray very fine to coarse SAND, some fine to medium subangular to rounded Gravel and Pebbles, trace Granules, Silt, and Brick fragments, poorly sorted, loose, dry.	
5 / 5	1	5-10	3.5	0.5 0.0 0.0 0.0 0.0			Dark grayish brown very fine to coarse SAND, trace Silt and Granules, poorly sorted, Brick from 7-8' bgs.	
10 / 0	2	10-15	2.5	0.4 0.0 0.0 0.0 0.0			SILT, some Clay, trace very fine Sand, medium to high plasticity, well sorted, dense, wet.	Boring backfilled to grade with bentonite pellets
15	3	15-20	4.6	0.0			Very dark brown to very dark gray very fine to medium SAND, trace Silt, well sorted, medium dense, wet.	

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million;

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

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Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B29

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				0.0			Very dark brown to very dark gray very fine to medium SAND, trace Silt, well sorted, medium dense, wet.	Boring backfilled to grade with bentonite pellets
	3	15-20	4.6	0.0				
				0.0			Odor from 18-30' bgs.	
				8.2				
20				57.2				
-10				56.7				
	4	20-25	4.6	4.9				
				1.1				
				1.7				
25				5.8			Slight stain at 25.5' bgs.	
-15				671.7				
	5	25-30	4.6	276.0				
				278.9				
				41.7				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million;

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/2/19 - 5/6/19	**Northing:** 186762.74	**Well/Boring ID:** **A-RH3-B30**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979615.72	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.53' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand-cleared from 0-5' bgs. CONCRETE. Dark red brown fine to coarse SAND, some fine to coarse subrounded Gravel, poorly sorted, dry.	
5 / 5	1	5-10	2.5	1.3 0.0 0.1 0.0 1.7			Light brown to gray SILT and very fine SAND, trace Granules, poorly sorted, dense, moist.	
10 / 0	2	10-15	4.5	0.1 0.0 0.0 0.0 0.0			Reddish brown SILT, some Clay, medium plasticity, well sorted, very dense, moist.	Boring backfilled to grade with bentonite pellets
15	3	15-20	4.0	1.0			Dark gray very fine to coarse SAND, trace Silt, medium dense, well sorted, wet, strong odor.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B30

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				8.7			Dark gray very fine to coarse SAND, trace Silt, medium dense, well sorted, wet, strong odor.	Boring backfilled to grade with bentonite pellets
	3	15-20	4.0	173.2				
				1,972				
				>15,000				
20				>15,000			Staining on liner from 20-28' bgs.	
-10				>15,000				
	4	20-25	5.0	>15,000				
				769.1				
				616.0				
25				>15,000				
-15				2,392				
	5	25-30	5.0	565.6				
				590.3			Gray very fine SAND and SILT, well sorted, dense, moist, strong odor.	
				616.6				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/6/19 - 5/8/19	**Northing:** 186744.26	**Well/Boring ID:** **A-RH3-B31**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979637.19	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.53' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 20' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand-cleared from 0-5' bgs. CONCRETE. Very fine to coarse SAND, some fine to coarse subangular Gravel, Brick, and Ash, dry.	
5 / 5	1	5-10	4.2	0.4 0.4 0.4 0.4 0.4			Black fine to coarse SAND, some Slag and Ash, trace fine Gravel, dry. Red brown Clayey fine SAND, low plasticity, moist.	
10 / 0	2	10-15	5.0	0.4 0.4 0.4 0.4 0.4			Red brown CLAY, trace fine Sand, high plasticity, moist.	Boring backfilled to grade with bentonite pellets
15	3	15-20	5.0	0.4			Red brown SILT, some fine to coarse Sand, trace fine angular Gravel, soft, wet.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B31

Borehole Depth: 20' bgs

Site Location:

68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				0.4			Red brown SILT, some fine to coarse Sand, trace fine angular Gravel, soft, wet.	Boring backfilled to grade with bentonite pellets
	3	15-20	5.0	0.4			Red brown CLAY, trace fine SAND, high plasticity, wet.	
				0.4				
				0.6			Dark red brown very fine to fine SAND, well sorted, wet.	
20							Refusal; end of boring at 20' bgs.	
-10								
25								
-15								
30								
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/6/19 - 5/8/19	**Northing:** 186696.21	**Well/Boring ID:** **A-RH3-B32**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979690.24	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.55' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand-cleared from 0-5' bgs. CONCRETE. Dark brown very fine to coarse SAND, some fine to medium subangular to subrounded Gravel and Pebbles, trace Silt, poorly sorted, loose, dry.	
5 / 5	1	5-10	3.8	0.0 0.0 0.0 0.0 0.0			Trace Brick and Coal fragments from 5-7' bgs. Grayish brown very fine to medium SAND, well sorted, moderately loose, strong odor.	
10 / 0	2	10-15	3.8	2,308 691.0 654.4 4,631 12,595			Wet at 12' bgs.	Boring backfilled to grade with bentonite pellets
15	3	15-20	4.6	15,000			Staining and small amount of NAPL from 15-20' bgs.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B32

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				15,000			Grayish brown very fine to medium SAND, well sorted, moderately loose, strong odor, staining and small amount of NAPL from 15-20' bgs.	Boring backfilled to grade with bentonite pellets
	3	15-20	4.6	15,000				
				15,000				
				7,185				
20				1,667				
-10				724.5				
	4	20-25	4.6	637.4			Trace to little Silt from 23-25' bgs.	
				342.3				
				230.9				
25				297.5				
-15				268.5				
	5	25-30	4.2	138.4				
				82.1				
				233.5				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/6/19 - 5/8/19	**Northing:** 186678.75	**Well/Boring ID:** **A-RH3-B33**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979708.56	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.52' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	NA NA NA NA NA			Hand-cleared from 0-5' bgs. CONCRETE. Very dark brown very fine to coarse SAND, some fine to medium subangular to subrounded Gravel and Pebbles, trace Silt and Brick fragments, poorly sorted, loose, dry.	
5 / 5	1	5-10	2.5	NA NA NA NA NA			Brown to grayish brown very fine to medium SAND, well sorted, medium dense, slight odor.	
10 / 0	2	10-15	3.3	NA NA NA NA NA				Boring backfilled to grade with bentonite pellets
15	3	15-20	4.6	NA			Wet at 15' bgs.	

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing. The PID malfunctioned during drilling at this boring.

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Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B33

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5	3	15-20	4.6	NA NA NA NA			Brown to grayish brown very fine to medium SAND, well sorted, medium dense, slight odor.	Boring backfilled to grade with bentonite pellets
20 / -10	4	20-25	4.6	NA NA NA NA NA				
25 / -15	5	25-30	NA	NA NA NA NA NA				
30 / -20							End of boring at 30' bgs.	
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing. The PID malfunctioned during drilling at this boring.

Date Start/Finish: 5/6/19 - 5/8/19	**Northing:** 186705.39	**Well/Boring ID:** **A-RH3-B34**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979728.39	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.52' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand-cleared from 0-5' bgs. CONCRETE. Very dark brown very fine to coarse SAND, some fine to medium subangular to subrounded Gravel and Pebbles, trace Silt, poorly sorted, loose, dry.	
5 / 5	1	5-10	4.2	18.3 16.6 16.8 20.0 20.3			Brown to gray very fine to medium SAND, well sorted, medium dense.	
10 / 0	2	10-15	5.0	24.2 41.9 40.6 74.6 67.1				Boring backfilled to grade with bentonite pellets
15	3	15-20	5.0	84.3			Wet at 15' bgs.	

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

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Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B34

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5							Brown to gray very fine to medium SAND, well sorted, medium dense.	Boring backfilled to grade with bentonite pellets
	3	15-20	5.0	114.0 344.8 359.0 105.9				
20				251.1				
-10				NA				
	4	20-25	4.8	109.8 64.9 172.7				
25				69.7				
-15				86.7				
	5	25-30	5.0	91.9 112.4 105.8				
30							End of boring at 30' bgs.	
-20								
35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/6/19 - 5/13/19	**Northing:** 186737.73	**Well/Boring ID:** **A-RH3-B35**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979711.09	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.72' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand-cleared from 0-5' bgs. CONCRETE. Brown fine to coarse SAND, some fine to coarse angular Gravel, Slag, and Brick, trace Silt, poorly sorted, dry.	
5 / 5	1	5-10	3.2	0.0 13.3 21.5 92.3 47.2			Dark brown to black fine to coarse SAND, some Slag and Ash, trace fine angular Gravel, poorly sorted, dry.	
10 / 0	2	10-15	3.5	123.6 74.1 70.2 >15,000 >15,000			Brown very fine to medium SAND, trace Silt, well sorted, wet, slight staining.	Boring backfilled to grade with bentonite pellets
15	3	15-20	5.0	128.8			Brown very fine to medium SAND, well sorted, wet, heavy staining.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B35

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				309.6			Brown very fine to medium SAND, well sorted, wet, heavy staining, golden brown NAPL from 16-16.5' bgs.	Boring backfilled to grade with bentonite pellets
	3	15-20	5.0	335.6			Brown very fine to fine SAND, well sorted, trace Silt, wet; staining from 17.5-28' bgs.	
				303.6				
20				345.4				
				423.3				
-10				384.6				
	4	20-25	5.0	222.0				
				81.4				
25				68.0				
				168.9				
-15				96.0				
	5	25-30	5.0	96.3				
				70.2				
30				107.4			End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/8/19	**Northing:** 186785.02	**Well/Boring ID:** **A-RH3-B36**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979659.10	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.65' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 11.65								
				0.0			Hand-cleared from 0-5' bgs. CONCRETE.	
				0.0			Dark brown fine to coarse SAND, some fine to coarse angular Gravel, Concrete, Slag, and Brick, dry. [FILL]	
10 / 1.65	NA	0-5	NA	0.0				
				0.0				
				0.0				
5 / 6.65				0.9			Black fine to coarse SAND, some Silt, trace fine Gravel, soft, moist, slight odor.	
				3.2				
5 / 6.65	1	5-10	2.8	48.2				
				73.3				
				65.5				
10 / 1.65				3.3			Black fine to coarse SAND, trace fine angular Gravel, Concrete, Brick, and Slag, moist, slight odor.	
				12.5				
0 / 11.65	2	10-15	3.5	5.1				Boring backfilled to grade with bentonite pellets
				23.3				
				1.7				
15 / -3.35	3	15-20	5.0	121.9			Dark gray brown fine to coarse SAND, well sorted, wet, odor.	

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B36

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5	3	15-20	5.0	84.4 380.3 239.6 93.6			Dark gray brown fine to coarse SAND, well sorted, wet, odor.	Boring backfilled to grade with bentonite pellets
20 -10	4	20-25	5.0	93.1 192.6 286.1 95.6 31.0			Red brown very fine to fine SAND, well sorted, wet, golden brown staining on liner.	
25 -15	5	25-30	5.0	25.5 53.9 6.9 55.6 46.3				
30 -20							End of boring at 30' bgs.	
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/6/19 - 5/10/19	**Northing:** 186806.75	**Well/Boring ID:** **A-RH3-B37**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979638.71	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.57' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand-cleared from 0-5' bgs. CONCRETE. Dark brown very fine to coarse SAND, some fine to medium angular Gravel and Pebbles, trace Silt, poorly sorted, loose, moist.	
5 / 5	1	5-10	2.3	120.4 117.5 741.2 4,497 1,697			Very fine to fine SAND, poorly sorted, moderately loose, moist, strong odor. Some crushed Stone at 7' bgs. Some Gravel at 8' bgs.	
10 / 0	2	10-15	4.2	89.7 1,075 168.8 743.2 857.2			Dark gray very fine to fine SAND, well sorted, moderately dense, wet, strong odor.	Boring backfilled to grade with bentonite pellets
15	3	15-20	4.2	357.2			Staining and sheen from 15-17.5' bgs	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B37

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5							Dark gray very fine to fine SAND, well sorted, moderately dense, wet, strong odor, staining and sheen from 15-17.5' bgs.	Boring backfilled to grade with bentonite pellets
	3	15-20	4.2	1,030 1,287 1,287 1,238				
20				2,491				
-10				654.9				
	4	20-25	4.2	3,805 659.9 362.0				
25				382.3				
-15				720.7				
	5	25-30	2.3	277.3 193.6 360.6				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/9/19	**Northing:** 186910.20	**Well/Boring ID:** **A-RH3-B38**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979587.28	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 7.54' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0							Hand-cleared from 0-5' bgs. CONCRETE.	
				0.0				
				0.0			Brown very fine to medium SAND, some fine to medium angular to subrounded Gravel and Pebbles, trace Silt, poorly sorted, loose, moist.	
5	NA	0-5	NA	0.0				
				0.0				
				0.0				
5				0.0			Dark brown fine to medium SAND, some angular to subangular Gravel, trace Silt, poorly sorted, loose, moist. [FILL]	
				0.0				
0	1	5-10	1.0	0.0				
				0.0				
				0.6				
10				0.0			Gray very fine to fine SAND, some Silt, well sorted, moderately dense, wet, slight odor.	
				427.9				Boring backfilled to grade with bentonite pellets
-5	2	10-15	3.5	125.6				
				0.0				
				0.4				
15	3	15-20	3.2	0.0				

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B38

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-10	3	15-20	3.2	0.0 0.0 0.0 0.0			Gray very fine to fine SAND, some Silt, well sorted, moderately dense, wet, slight odor.	Boring backfilled to grade with bentonite pellets
20							Grayish brown very fine to medium SAND, well sorted, moderately dense, moist, slight odor.	
-15	4	20-25	5.0	0.0 0.0 0.0 0.0 0.0				
25								
-20	5	25-30	3.0	0.0 0.0 0.0 0.0 0.0				
30							End of boring at 30' bgs.	
-25								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/7/19 - 5/8/19	**Northing:** 186887.82	**Well/Boring ID:** **A-RH3-B39**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979627.01	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 9.58' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0							Hand-cleared from 0-5' bgs. ASPHALT.	
				0.0			Dark brown very fine to medium SAND, some fine to medium subangular to subrounded Gravel and Pebbles, loose, dry, slight odor.	
				0.0				
	NA	0-5	NA	0.0				
				0.0				
5				0.0				
5				0.0			Dark gray very fine to medium SAND, trace Silt, well sorted, moderately loose, strong odor.	
				0.0				
	1	5-10	2.1	584			Wet at 7' bgs. Iridescence and staining from 7-15' bgs.	
				649.0				
0				629.5				
10				522.7				
				719.1				Boring backfilled to grade with bentonite pellets
	2	10-15	2.5	169.2				
				2,064				
-5				2,565				
15							Gray SILT, some Clay, medium to high plasticity, dense, moist, odor.	
	3	15-20	1.7	386.1				

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B39

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0							Gray SILT, some Clay, medium to high plasticity, dense, moist, odor.	Boring backfilled to grade with bentonite pellets
	3	15-20	1.7	166.6 101.7 70.6 61.2			Grayish brown to dark gray very fine to medium SAND, trace Silt, well sorted, moderately loose, wet, odor.	
-10 / 20							NAPL from 20-23' bgs.	
	4	20-25	4.2	>15,000 >15,000 4,062 373 399.1				
-15 / 25								
	5	25-30	4.6	700.2 284.3 126.1 195.1 45.5				
-20 / 30							End of boring at 30' bgs.	
-25 / 35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/7/19 - 5/8/19	**Northing:** 186873.93	**Well/Boring ID:** **A-RH3-B40**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979617.98		
Driller's Name: Chris Iodice	**Casing Elevation:** NA	**Client:** BT Red Hook, LLC	
Drilling Method: Direct Push	**Surface Elevation:** 9.22' AMSL		
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0							Hand-cleared from 0-5' bgs. ASPHALT.	
				0.0			Dark brown very fine to coarse SAND, some fine to medium subangular to subrounded Gravel and Pebbles, loose, dry, slight odor. [FILL]	
				0.0				
	NA	0-5	NA	0.0				
				0.0				
5				0.0				
5				464.1			Dark gray very fine to medium SAND, little Silt, well sorted, medium dense, strong odor, tar-like substance from 5-6' bgs.	
				349.1				
							Wet at 7' bgs; sheen from 7-19' bgs.	
	1	5-10	2.1	890.2				
0				756.4				
				427.9				
10				3,720				
				1,420				Boring backfilled to grade with bentonite pellets
	2	10-15	2.9	1,682				
				486.2				
-5				244.6				
15								
	3	15-20	4.6	197.5				

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

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Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B40

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
	3	15-20	4.6	134.1 61.3 1,657 738.5			Dark gray very fine to medium SAND, little Silt, well sorted, medium dense, wet, strong odor, sheen from 7-19' bgs.	Boring backfilled to grade with bentonite pellets
-10 20	4	20-25	3.3	3,161 >15,000 3,501 974.0 1,956			Dark gray very fine to medium SAND, well sorted, medium dense, wet, staining from 19-28' bgs.	
-15 25	5	25-30	NA	494.1 365.2 171.6 162.9 41.3				
-20 30							End of boring at 30' bgs.	
-25 35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/13/19	**Northing:** 186762.70	**Well/Boring ID:** **A-RH3-B41**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979686.04	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.65' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 11.65				0.0			Hand-cleared from 0-5' bgs. CONCRETE.	
				0.0			Brown fine to coarse SAND, some fine to coarse subangular Gravel, Slag, and Brick, poorly sorted, dry.	
10 / 1.65	NA	0-5	NA	0.0				
				0.0				
				0.0				
5 / 6.65				11.8			Dark brown and black fine to coarse SAND, some fine to coarse angular Gravel, Slag, Ash, and Brick, poorly sorted, dry.	
5 / 6.65				6.6				
	1	5-10	3.0	6.3				
				6.2				
				40.0				
10 / 1.65				82.9			Black SILT, trace fine Sand, soft, wet.	
0 / 11.65				32.2				Boring backfilled to grade with bentonite pellets
	2	10-15	3.0	48.2				
				20.3			Gray brown fine to coarse SAND, trace Silt, well sorted, moist.	
				15.4			Red brown and dark gray SILT, some fine Sand, soft, moist.	
15 / -3.35	3	15-20	5.0	50.7				

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B41

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				144.4			Red brown and dark gray SILT, some fine Sand, soft, moist.	Boring backfilled to grade with bentonite pellets
	3	15-20	5.0	10.6				
				66.5				
20				92.0				
				134.1			Red brown very fine to fine SAND, trace Silt, well sorted, wet, heavy staining.	
-10				75.8				
	4	20-25	5.0	100.1				
				34.5				
25				43.5				
				55.6				
-15				63.7				
	5	25-30	5.0	81.2				
				43.2				
30				32.5			End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/10/19	**Northing:** 186725.88	**Well/Boring ID:** **A-RH3-B42**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979658.25	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.53' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand-cleared from 0-5' bgs. CONCRETE. Dark brown very fine to coarse SAND, some fine to medium angular Gravel and Pebbles, trace Silt, poorly sorted, loose, moist. [FILL]	
5 / 5	1	5-10	3.5	33.6 121.8 44.5 11.6			Reddish brown SILT and CLAY, medium to high plasticity, well sorted, dense, moist, slight odor.	
10 / 0	2	10-15	5.0	8.2 161.1 74.5 379.9 190.1				Boring backfilled to grade with bentonite pellets
15	3	15-20	5.0	>15,000			Dark gray very fine to medium SAND, well sorted, moderately loose, wet, strong odor, heavy staining from 15-23' bgs, NAPL saturation from 15-18' bgs.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueoous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B42

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5							Dark gray very fine to medium SAND, well sorted, moderately loose, wet, strong odor, heavy staining from 15-23' bgs, NAPL saturation from 15-18' bgs.	Boring backfilled to grade with bentonite pellets
	3	15-20	5.0	>15,000				
				>15,000				
				>15,000				
				>15,000				
20				>15,000				
-10				>15,000				
	4	20-25	4.6	>15,000				
				3,657				
				1,082				
25				731.6				
-15				1,679				
	5	25-30	NA	3,569				
				2,336				
				890.4				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueoous phase liquid.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/9/19	**Northing:** 186886.53	**Well/Boring ID:** **A-RH3-B43**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979549.14	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 7.20' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0				0.0			Hand-cleared from 0-5' bgs. ASPHALT and GRAVEL.	
				0.0			Brown very fine to medium SAND, some fine to medium angular to subangular Gravel and Pebbles, trace Silt, loose, moist.	
5	NA	0-5	NA	0.0				
				0.0				
				0.0				
5				0.0			Dark gray very fine SAND and SILT, well sorted, wet, odor, heavy staining.	
				0.0				
0	1	5-10	0.5	0.0				
				0.0				
				0.0				
10				78.2				
				0.0				Boring backfilled to grade with bentonite pellets
-5	2	10-15	5.0	0.0			Grayish brown very fine to medium SAND, well sorted, moderately dense, wet.	
				0.0				
				0.0				
15								
	3	15-20	4.2	0.0				

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B43

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-10	3	15-20	4.2	0.0 0.0 0.0 0.0			Grayish brown very fine to medium SAND, well sorted, moderately dense, wet.	Boring backfilled to grade with bentonite pellets
20								
-15	4	20-25	4.2	0.0 0.0 0.0 0.0 0.0				
25								
-20	5	25-30	5.0	0.0 0.0 0.0 0.0 0.0				
30							End of boring at 30' bgs.	
-25								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/23/19	**Northing:** 186731.49	**Well/Boring ID:** **A-RH3-B44**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979750.49	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.50' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 25' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10				0.0			Hand-cleared from 0-5' bgs. CONCRETE.	
				0.0			Dark red brown fine to coarse SAND, trace fine angular Gravel, Slag, and Brick, poorly sorted, dry.	
	NA	0-5	NA	0.0				
				0.0				
				0.0				
5 / 5				1.2				
				2.2			Red brown fine to coarse SAND, trace Silt, well sorted, moist.	
	1	5-10	3.0	1.1				
				0.9				
				4.1				
10 / 0				3.9			SILT, some fine Sand, soft, wet.	
				7.5				
	2	10-15	3.5	15.0				
				4.3				
				88.4			Very fine to fine SAND, trace Silt, well sorted, wet, staining.	
15	3	15-20	5.0	101.5				

Boring backfilled to grade with bentonite pellets

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-B44

Borehole Depth: 25' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5	3	15-20	5.0	133.7 75.5 41.2 15.6			Very fine to fine SAND, trace Silt, well sorted, wet, staining.	Boring backfilled to grade with bentonite pellets
20	4	20-25	5.0	90.2 49.0 12.2 11.2 6.0			
-10							
25							Refusal; end of boring at 25' bgs.	
-15								
30								
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

No analytical samples collected. Soil descriptions from 0-5' bgs from observation during hand clearing.

Date Start/Finish: 5/7/19	**Northing:** 186920.71	**Well/Boring ID:** **A-RH3-WS13**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979619.54	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 8.09' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 28.5' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
10								
0								
				0.0			Hand cleared from 0-5' bgs. ASPHALT and GRAVEL.	
				0.0			Brown very fine to coarse SAND, some fine to medium subangular to subrounded Gravel and Pebbles, trace Silt, poorly sorted, loose, dry.	
5	NA	0-5	NA	0.0				
				0.0				
				0.0				
5				26.0			Fine to medium SAND, trace Silt, well sorted, moderately dense, odors.	
				NA				
							Wet at 7' bgs.	
0	1	5-10	2.1	102.4				
				186.9				
				234.0				
10							Significant staining at 10' bgs.	
								Boring backfilled to grade with bentonite pellets
-5	2	10-15	0.4	141.1				
15								
	3	15-20	4.6	20.3				

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 9-10' bgs, and 20-21' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-28.5' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS13

Borehole Depth: 28.5' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-10	3	15-20	4.6	6.1 1.9 0.9 1.0			Fine to medium SAND, trace Silt, well sorted, moderately dense, odors. Light to grayish brown SILT and very fine SAND, well sorted, medium to low plasticity, dense, moist, odors.	Boring backfilled to grade with bentonite pellets
20	4	20-25	4.2	0.0 0.0 0.0 0.0 0.0	X		Light grayish brown fine to medium SAND, well sorted, moderately dense, moist.	
-15								
25	5	25-28.5	3.0	NA NA NA				
-20							Refusal; end of boring at 28.5' bgs.	
30								
-25								
35								

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 9-10' bgs, and 20-21' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-28.5' bgs) composite samples were collected for analysis of waste disposal parameters.

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Date Start/Finish: 5/8/19	**Northing:** 186848.27	**Well/Boring ID:** **A-RH3-WS14**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979632.88	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.64' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10				0.0			Hand cleared from 0-5' bgs. CONCRETE.	
	NA	0-5	NA	0.0			Dark gray brown fine to coarse SAND, some fine to coarse subangular Gravel, Concrete, Slag, and Brick, dry. [FILL]	
				0.0				
				0.0				
5 / 5				>15,000			Gray very fine to medium SAND, trace Pebbles, poorly sorted, dry, slight odor.	
	1	5-10	5.0	956				
				1,640				
				3,706			Brown very fine SAND and SILT, well sorted, dense, moist, odor.	
10 / 0				345.0				
				155.6			Dark gray very fine to coarse, SAND, some fine to coarse subangular Gravel, poorly sorted, moist.	
				2,693				Boring backfilled to grade with bentonite pellets
	2	10-15	4.2	2,509				
				>15,000				
15				10,499				
	3	15-20	1.8	1,433			Brown very fine to fine SAND, well sorted, moderately dense, wet, strong odor, staining.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 5-6' bgs, 19-20' bgs, and 24-25' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS14

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5	3	15-20	1.8	>15,000 >15,000 >15,000 >15,000			Brown very fine to fine SAND, well sorted, moderately dense, wet, strong odor, staining.	Boring backfilled to grade with bentonite pellets
20							NAPL from 19-20' bgs.	
-10	4	20-25	4.1	1,022 12,670 >15,000 >15,000 >15,000				
25								
-15	5	25-30	4.2	>15,000 2,380 639 967 541				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 5-6' bgs, 19-20' bgs, and 24-25' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/14/19	**Northing:** 186859.87	**Well/Boring ID:** **A-RH3-WS15**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979657.59	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.50' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0			Hand cleared from 0-5' bgs. CONCRETE.	
				0.0			Gray coarse angular GRAVEL, some Concrete, loose, dry.	
				0.0			Dark brown fine to coarse SAND, some fine to medium Gravel and Pebbles, poorly sorted, loose, moist.	
				0.0				
				0.0				
5 / 5	1	5-10	0.5	82.0			Dark gray fine to medium SAND, little Silt, well sorted, moderately dense, wet, odor.	
				123.1				
				70.6				
				52.6				
				383.8				
10 / 0	2	10-15	2.5	482.3				
				1,908				
				825.5				
				687.5				
				360.9			Dark gray SILT, some fine Sand, well sorted, dense, wet, odor.	
15	3	15-20	2.5	324.5				

Boring backfilled to grade with bentonite pellets

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 16-17' bgs, and 28-29' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS15

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				13,176			Dark gray SILT, some fine Sand, well sorted, dense, wet, odor. NAPL from 16-19' bgs.	Boring backfilled to grade with bentonite pellets
	3	15-20	2.5	1,850				
				713.8				
				477.6			Dark gray fine to medium SAND, trace Silt, well sorted, moderately dense, wet.	
20				1,332				
-10				513.2				
	4	20-25	4.5	865.8			NAPL from 23-24' bgs.	
				773.6				
				6,180			Staining from 25-30' bgs.	
25				1,260				
-15				893.6				
	5	25-30	5.0	512.9				
				1,664				
				621.8				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 16-17' bgs, and 28-29' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/13/19	**Northing:** 186683.75	**Well/Boring ID:** **A-RH3-WS16**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979680.26	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.51' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10				0.0			Hand cleared from 0-5' bgs. CONCRETE.	
	NA	0-5	NA	0.0			Dark brown very fine to coarse SAND, some fine to coarse angular Gravel, trace Silt, poorly sorted, moist.	
				0.0				
				0.0				
5 / 5				0.0	X		Dark brown to black fine to coarse SAND, some Slag and Ash, trace fine angular Gravel, dry.	
	1	5-10	4.2	0.0			Gray brown very fine to medium SAND, trace Silt, well sorted, moist.	
				3.6				
10 / 0				0.0			Fine to coarse SAND, trace Silt, well sorted, moist to wet.	
	2	10-15	3.8	0.0				
				7.6				
15 / -5				60.6				
	3	15-20	5.0	0.2			Dark brown very fine to fine SAND, some Silt, well sorted, wet, slight staining, odor. Wet at 15' bgs.	

Boring backfilled to grade with bentonite pellets

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 5-6' bgs, 19-20' bgs, and 20-21' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS16

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5	3	15-20	5.0	9.4 31.7 52.1 238.5			Dark brown very fine to fine SAND, some Silt, well sorted, wet, slight staining, odor.	Boring backfilled to grade with bentonite pellets
20 / -10	4	20-25	5.0	6,802 1,618 1,295 771.1 1,143			Dark brown very fine to fine SAND, some Silt, well sorted, wet, heavy staining, amber color in saturated pore space.	
25 / -15	5	25-30	5.0	168.1 255.5 214.6 152.9 447.0			Dark brown very fine to fine SAND, trace Silt, well sorted, wet, strong odor, slight staining from 25-27' bgs.	
30							End of boring at 30' bgs.	
-20 / 35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 5-6' bgs, 19-20' bgs, and 20-21' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/10/19 - 5/13/19	**Northing:** 186838.85	**Well/Boring ID:** **A-RH3-WS17**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979645.52	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.65' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 11.65				0.0			Hand cleared from 0-5' bgs. CONCRETE.	
10 / 1.65				0.0			Very dark brown fine to coarse SAND, some fine to medium Gravel and Pebbles, poorly sorted, loose, moist, slight odor.	
	NA	0-5	NA	0.0				
				63.7				
				157.8				
5 / 6.65				193.5			Dark brown fine to coarse SAND, some fine to coarse subangular Gravel, trace Slag, Brick, and Silt, dry, slight odor.	
5 / 6.65				79.2				
	1	5-10	2.5	77.7				
				235.7				
				339.3				
10 / 1.65				140.2				
0 / 11.65				174.1			Dark gray brown fine to coarse SAND, trace fine to coarse angular Gravel and Silt, wet, slight staining.	Boring backfilled to grade with bentonite pellets
	2	10-15	2.5	177.6				
				166.5				
				162.4				
15 / -3.35								
	3	15-20	2.6	66.7				

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 19-20' bgs, and 24-25' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS17

Borehole Depth: 30' bgs

Site Location:

68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5	3	15-20	2.6	252.8 251.6 193.3 194.1			Dark gray brown fine to coarse SAND, trace fine to coarse angular Gravel and Silt, wet, slight staining.	Boring backfilled to grade with bentonite pellets
20	4	20-25	5.0	34.4 40.2 458.2 551.9 619.7			Dark brown very fine to medium SAND, well sorted, wet, NAPL from 20-23' bgs.	
-10								
25	5	25-30	5.0	214.8 178.0 298.7 366.7 326.6			Staining from 25-27' bgs.	
-15								
30							End of boring at 30' bgs.	
-20								
35								

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 19-20' bgs, and 24-25' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

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Date Start/Finish: 5/14/19	**Northing:** 186715.25	**Well/Boring ID:** **A-RH3-WS18**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979646.87	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.57' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand cleared from 0-5' bgs. CONCRETE. Dark brown fine to coarse SAND, some fine to coarse angular Gravel, Slag, and Brick, poorly sorted, dry.	
5 / 5	1	5-10	3.0	0.0 0.0 0.0 0.0 0.0			Black fine to coarse SAND, some Slag, poorly sorted, dry. Red brown CLAY, some fine Sand, low plasticity, stiff, moist.	
10 / 0	2	10-15	4.2	0.0 0.0 0.0 0.0 0.0			Red brown very fine to medium SAND, trace Sand, well sorted, wet.	Boring backfilled to grade with bentonite pellets
15	3	15-20	5.0	0.0				

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 18-19' bgs, and 23-24' for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS18

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / -5				0.0			Red brown very fine to medium SAND, trace Sand, well sorted, wet.	Boring backfilled to grade with bentonite pellets
	3	15-20	5.0	>15,000			Staining from 17-19' bgs.	
				>15,000				
				>15,000				
20				1,002			Gray very fine to medium SAND, trace Silt, well sorted, wet, odor, staining from 20-27' bgs.	
-10				7,668				
	4	20-25	5.0	>15,000				
				>15,000				
				>15,000				
25				10,727				
-15				1,572				
	5	25-30	5.0	2,056				
				881.2				
				1,018				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 18-19' bgs, and 23-24' for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/14/19	**Northing:** 186827.98	**Well/Boring ID:** **A-RH3-WS19**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979658.44	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.65' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand cleared from 0-5' bgs. CONCRETE. Brown fine to coarse SAND, some fine to coarse angular Gravel and Brick, poorly sorted, dry.	
5 / 5	1	5-10	4.0	0.0 0.0 0.0 70.24 >15,000			Red BRICK, some fine to coarse SAND and Gravel, poorly sorted, dry. [FILL] Dark gray brown fine to coarse SAND, some Slag, Concrete, and Ash, trace angular Gravel, moist.	
10 / 0	2	10-15	3.2	9,135 >15,000 >15,000 >15,000 >15,000			Dark brown fine to coarse SAND, some Silt, poorly sorted, wet, staining.	Boring backfilled to grade with bentonite pellets
15	3	15-20	4.2	3,075			Gray brown fine to coarse SAND, trace Silt, wet, staining from 15-17' bgs.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 14-15' bgs, and 22-23' for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: **A-RH3-WS19**

Borehole Depth: 30' bgs

Site Location:

68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5	3	15-20	4.2	4,579 3,879 >15,000 >15,000			Gray brown fine to coarse SAND, trace Silt, wet, staining from 15-17' bgs. NAPL from 19-20' bgs.	Boring backfilled to grade with bentonite pellets
20 -10	4	20-25	5.0	4,808 >15,000 >15,000 6,735 5,039			Dark gray brown very fine to fine SAND, trace Silt, well sorted, staining from 20-29' bgs.	
25 -15	5	25-30	5.0	790.7 674.9 566.9 602.9 565.1				
30 -20 35							End of boring at 30' bgs.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 14-15' bgs, and 22-23' for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/14/19	**Northing:** 186756.19	**Well/Boring ID:** **A-RH3-WS20**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979719.01	**Client:** BT Red Hook, LLC	
Driller's Name: Jimmy McGill	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.64' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand cleared from 0-5' bgs. CONCRETE. Brown to black fine to coarse SAND, some Ash, Slag, Brick, trace fine Gravel and Silt, dry.	
5 / 5	1	5-10	3.2	0.0 0.0 45.4 180.4 0.0				
10 / 0	2	10-15	3.0	4.3 33.8 43.4 386.6 4,092			Brown SILT, soft, trace fine SAND, moist. Dark brown Silty fine SAND, trace fine to coarse Gravel, moist. Slight staining from 14-15' bgs.	Boring backfilled to grade with bentonite pellets
15	3	15-20	5.0	1,388			Dark brown very fine to medium SAND, trace Silt, well sorted, wet, heavy staining, NAPL from 15-16' bgs.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 17-18' bgs, and 23-24' for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS20

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / -5				5,916			Very fine to medium SAND, trace Silt, well sorted, wet.	Boring backfilled to grade with bentonite pellets
	3	15-20	5.0	>15,000				
				4,559				
20				>15,000				
				8,229				
-10				>15,000			Heavy staining and NAPL from 22-27' bgs	
	4	20-25	5.0	>15,000				
				>15,000				
25				2,810				
				7,077				
-15				2,885				
	5	25-30	5.0	540.9				
				1,736				
30				823.9				
							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 6-7' bgs, 17-18' bgs, and 23-24' for analysis of volatile organic compounds. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/21/19	**Northing:** 186770.14	**Well/Boring ID:** **A-RH3-WS21**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979726.01	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.57' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 11.57								
				0.0			Hand cleared from 0-5' bgs. CONCRETE.	
10				0.0			Brown and black fine to coarse SAND, some fine to coarse angular Gravel, some Slag, Brick, Ash, and Asphalt, poorly sorted, dry.	
	NA	0-5	NA	0.0				
				0.0				
				0.0				
5				0.0				
5				1.2				
	1	5-10	3.2	0.0				
				0.8				
				6.7				
10				20.2				
0				14.8			Dark brown very fine to fine SAND, some Silt, poorly sorted, wet.	Boring backfilled to grade with bentonite pellets
	2	10-15	4.0	27.0				
				52.4				
				503.3				
15								
	3	15-20	4.3	204.4			Dark brown fine to coarse SAND, trace Silt, poorly sorted, wet, slight odor.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

Soil descriptions from 0-5' bgs from observation during hand clearing. Sample collected from 17-17.5' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs) and deep (7-20' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS21

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				188.7			Dark brown fine to coarse SAND, trace Silt, poorly sorted, wet, slight odor.	Boring backfilled to grade with bentonite pellets
				1,161	X		Brown very fine to fine SAND, well sorted, wet, some staining.	
	3	15-20	4.3	722.5				
				539.2				
20				1,611			Trace Silt, heavy staining from 20-23' bgs.	
-10				569.9				
	4	20-25	5.0	244.8				
				239.9				
				248.5				
25				247.5			Heavy staining from 25-28' bgs.	
-15				283.2				
	5	25-30	5.0	766.5				
				306.5				
				271.1				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million.

Soil descriptions from 0-5' bgs from observation during hand clearing. Sample collected from 17-17.5' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs) and deep (7-20' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/21/19	**Northing:** 186746.77	**Well/Boring ID:** **A-RH3-WS22**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979730.07	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.63' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 22' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand cleared from 0-5' bgs. CONCRETE. Brown and black fine to coarse SAND, some Slag, Brick, and Ash, trace fine to coarse angular Gravel, poorly sorted, dry.	
5 / 5	1	5-10	3.5	0.0 0.0 0.0 0.0 0.0			Brown very fine to fine SAND, trace Silt, well sorted, dry.	
10 / 0	2	10-15	3.5	0.0 4.5 21.2 130.2 106.8			Brown SILT, some fine to medium SAND, wet. Dark brown very fine to coarse SAND, trace Silt, well sorted, moist.	Boring backfilled to grade with bentonite pellets
15	3	15-20	5.0	2,506			Dark brown very fine to fine SAND, little Silt, well sorted, wet, heavy staining from 15-18' bgs.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Sample collected from 16-16.5' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs) and deep (7-20' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: **A-RH3-WS22**

Borehole Depth: 22' bgs

Site Location:

68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5	3	15-20	5.0	2,539 1,232 907 1,863	X		Dark brown very fine to fine SAND, little Silt, well sorted, wet, heavy staining from 15-18' bgs.	Boring backfilled to grade with bentonite pellets
20	4	20-22	2.7	902.5 1,211			NAPL from 20-21' bgs.	
-10							Refusal; end of boring at 22' bgs.	
25								
-15								
30								
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Sample collected from 16-16.5' bgs for analysis of volatile organic compounds. Shallow (1-7' bgs) and deep (7-20' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/21/19	**Northing:** 186769.76	**Well/Boring ID:** **A-RH3-WS23**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979712.75	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.56' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 11.56				0.0			Hand cleared from 0-5' bgs. CONCRETE.	
10 / 1.56				0.0			Gray brown fine to coarse SAND, some Brick, Ash, Concrete, and Slag, trace fine angular Gravel, poorly sorted, dry.	
	NA	0-5	NA	0.0				
				0.0				
				0.0				
5 / 6.56				0.0				
5 / 6.56				0.0				
	1	5-10	3.5	110.4			Odor from 8-11' bgs.	
				378.2				
				59.7				
10 / 1.56				850.6				
0 / 11.56				469.9			Gray brown fine to coarse SAND, some Silt, well sorted, wet, odor.	Boring backfilled to grade with bentonite pellets
	2	10-15	3.2	523.0				
				674.4				
				534.5				
15 / -3.44	3	15-20	5.0	60.5			Dark brown fine to medium SAND, some Silt, well sorted, wet, heavy staining, blebs from 15-16.5' bgs.	

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Sample collected from 18-19' bgs for analysis of volatile organic compounds. A deep (7-20' bgs) composite sample was collected for analysis of waste disposal parameters.

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Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS23

Borehole Depth: 30' bgs

Site Location:

68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				1,311			Dark brown fine to medium SAND, some Silt, well sorted, wet, heavy staining, blebs from 15-16.5' bgs.	Boring backfilled to grade with bentonite pellets
				1,300				
	3	15-20	5.0	2,831				
				945.6				
20							Very fine to fine SAND, trace Silt, well sorted, liner stained (no staining in soil), wet.	
				450.7				
-10				821.7				
	4	20-25	5.0	300.3				
				229.5				
				324.8				
25								
				145.3				
-15				89.1				
	5	25-30	5.0	69.0				
				83.9				
				331.0				
30							End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Sample collected from 18-19' bgs for analysis of volatile organic compounds. A deep (7-20' bgs) composite sample was collected for analysis of waste disposal parameters.

Date Start/Finish: 5/22/19	**Northing:** 186835.30	**Well/Boring ID:** **A-RH3-WS24**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979672.72	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.44' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 10	NA	0-5	NA	0.0 0.0 0.0 0.0 0.0			Hand cleared from 0-5' bgs. CONCRETE. Brown fine to coarse SAND, some fine to coarse angular Gravel, trace Brick and Slag, poorly sorted, dry.	
5 / 5	1	5-10	1.2	0.0 0.0 5.7 6.1 248.1				
10 / 0	2	10-15	1.2	399.1 124.6 252.6 28.8 33.2			Dark brown SILT, some fine to coarse Sand, soft, wet, odor, staining, NAPL from 10-11' bgs.	Boring backfilled to grade with bentonite pellets
15	3	15-20	4.0	56.5			Dark brown fine to coarse SAND, some Silt, well sorted, wet, some staining.	

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 10-11' bgs and 21-22' bgs for analysis of volatile organic compounds. Intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS24

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				105.1			Dark brown fine to coarse SAND, some Silt, well sorted, wet, some staining.	Boring backfilled to grade with bentonite pellets
							White fine to coarse angular GRAVEL (crushed quartz), poorly sorted, dry.	
	3	15-20	4.0	61.5			Dark brown very fine to medium SAND, trace Silt, well sorted, wet, slight staining.	
				11.3				
20				87.8				
				344.9			Very fine to fine SAND, trace Silt, well sorted, wet, slight odor and staining.	
-10				371.1				
	4	20-25	5.0	118.9				
				34.6				
25				266.1				
				54.1				
-15				218.3				
	5	25-30	5.0	80.9				
				170.6				
30				154.7			End of boring at 30' bgs.	
-20								
35								

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Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 10-11' bgs and 21-22' bgs for analysis of volatile organic compounds. Intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/23/19	**Northing:** 186819.32	**Well/Boring ID:** **A-RH3-WS25**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979666.45	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.58' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 11.58				0.0			Hand cleared from 0-5' bgs. CONCRETE.	
10 / 1.58				0.0			Brown fine to coarse SAND, some fine to coarse subangular Gravel, trace Brick and Concrete, poorly sorted, dry.	
	NA	0-5	NA	0.0				
				0.0				
				0.0				
5 / 6.58				8.8				
5 / 6.58				49.6				
	1	5-10	3.7	129.0				
				40.4				
				32.5				
10 / 1.58				101.7			Very fine to medium SAND, some Silt, well sorted, wet, heavy staining.	
0 / 11.58				52.3				
	2	10-15	3.5	51.7				
				138.9				
				239.7				
15 / -3.42	3	15-20	5.0	129.5			Dark brown fine to coarse SAND, some Silt, poorly sorted, wet, heavy staining, NAPL from 15-17.5' bgs.	

Boring backfilled to grade with bentonite pellets

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS25

Borehole Depth: 30' bgs

Site Location:

68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
-5				69.9			Dark brown fine to coarse SAND, some Silt, poorly sorted, wet, heavy staining, NAPL from 15-17.5' bgs.	Boring backfilled to grade with bentonite pellets
				124.9				
	3	15-20	5.0	398.0			Dark brown very fine to fine SAND, trace Silt, well sorted, wet, some staining.	
				395.6				
20				186.4				
-10				313.6				
	4	20-25	5.0	41.4				
				49.7				
				71.8				
25				78.9				
-15				90.8				
	5	25-30	5.0	87.0				
				96.7				
				55.3				
30							End of boring at 30' bgs.	
-20								
35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Shallow (1-7' bgs), intermediate (7-20' bgs), and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Date Start/Finish: 5/22/19	**Northing:** 186824.92	**Well/Boring ID:** **A-RH3-WS26**	
Drilling Company: Aquifer Drilling & Testing, Inc.	**Easting:** 979642.89	**Client:** BT Red Hook, LLC	
Driller's Name: Chris Iodice	**Casing Elevation:** NA		
Drilling Method: Direct Push	**Surface Elevation:** 11.66' AMSL	**Location:** 68 and 100 Ferris Street/ 242 and 300 Coffey Street Brooklyn, NY	
Sampling Method: 2-inch x 5-foot Macro-core	**Borehole Depth:** 30' bgs		
Rig Type: Geoprobe 6610	**Descriptions By:** N. Comrie, C. Goldsmith		

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / 11.66				0.0			Hand cleared from 0-5' bgs. CONCRETE.	
				0.0			Gray brown fine to coarse SAND, some fine to coarse angular Gravel, some Brick, Slag, and Concrete, trace Silt, poorly sorted, dry.	
10 / 1.66	NA	0-5	NA	0.0				
				0.0				
				0.0				
5 / 6.66				45.0				
				168.1				
5 / 6.66	1	5-10	1.5	83.9				
				125.3				
				133.6				
10 / 1.66				167.3				
				192.5				Boring backfilled to grade with bentonite pellets
0 / 11.66	2	10-15	1.8	70.0				
				96.4				
				70.7				
15 / -3.34	3	15-20	4.0	396.7			Gray brown CLAY, some fine Sand, low plasticity, moist, slight odor.	

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 18-19' bgs and 20-21' bgs for analysis of volatile organic compounds. Intermediate (7-20' bgs) and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

Client: BT Red Hook, LLC

Well/Boring ID: A-RH3-WS26

Borehole Depth: 30' bgs

Site Location:
68 and 100 Ferris Street/
242 and 300 Coffey Street
Brooklyn, NY

Depth (feet bgs) / Elevation (feet AMSL)	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0 / -5				194.9			Gray brown CLAY, some fine Sand, low plasticity, moist, slight odor.	Boring backfilled to grade with bentonite pellets
				182.1				
	3	15-20	4.0	318.7				
				481.8			Dark gray brown fine to medium SAND, trace Silt, well sorted, wet, staining from 19-25' bgs.	
20 / -10				228.2			Dark gray brown very fine to fine SAND, trace Silt, well sorted, wet.	
				41.9				
	4	20-25	5.0	33.8				
				61.7				
				22.7				
25 / -15				473.5			Blebs from 25-28' bgs; slight odor from 25-30' bgs.	
				207.2				
	5	25-30	5.0	465.2				
				44.5				
30 / -20				56.2			End of boring at 30' bgs.	
35								

ARCADIS Design & Consultancy for natural and built assets

Remarks: bgs = below ground surface; NA = not applicable/available; AMSL = above mean sea level; PID = photoionization detector; ppm = parts per million; NAPL = non-aqueous phase liquid.

Soil descriptions from 0-5' bgs from observation during hand clearing. Samples collected from 18-19' bgs and 20-21' bgs for analysis of volatile organic compounds. Intermediate (7-20' bgs) and deep (20-30' bgs) composite samples were collected for analysis of waste disposal parameters.

ATTACHMENT 3

Confirmation Soil Boring Photolog

BT Red Hook, LLC - Red Hook 3
Excavation Interim Remedial Measure Confirmation Soil Borings
68 and 100 Ferris Street/242 and 300 Coffey Street, Brooklyn, NY

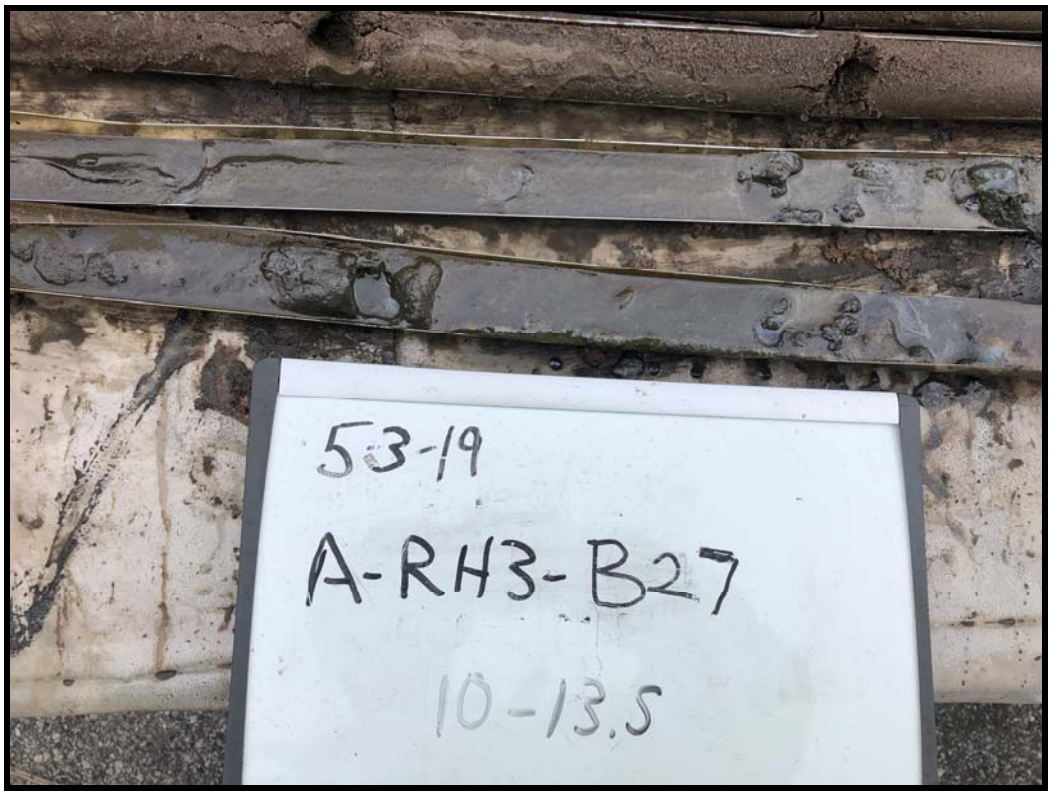
Hand-Cleared Upper 5 Feet (Typical)

A-RH3-B24: 5- to 30-Foot Soil Cores

A-RH3-B25: Staining at 7 to 12 Feet

A-RH3-B26: 5- to 30-Foot Soil Cores

A-RH3-B27: 5- to 30-Foot Soil Cores



A-RH3-B27: NAPL at 10 to 13.5 Feet

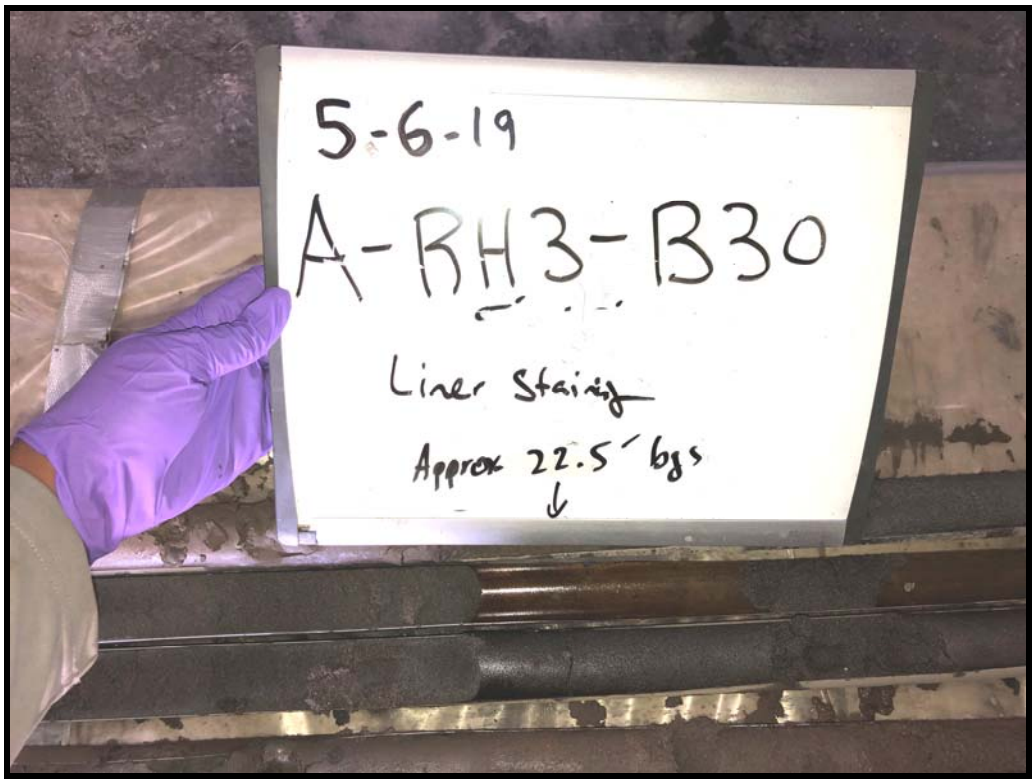
A-RH3-B27: NAPL at 15 to 18.5 Feet

A-RH3-B28: 5- to 30-Foot Soil Cores

A-RH3-B28: Staining and Slight Sheen at 10 to 14 Feet and 15 to 17 Feet

A-RH3-B29: 5- to 30-Foot Soil Cores

A-RH3-B30: 5- to 30-Foot Soil Cores



A-RH3-B30: Staining in Liner at 22.5 Feet

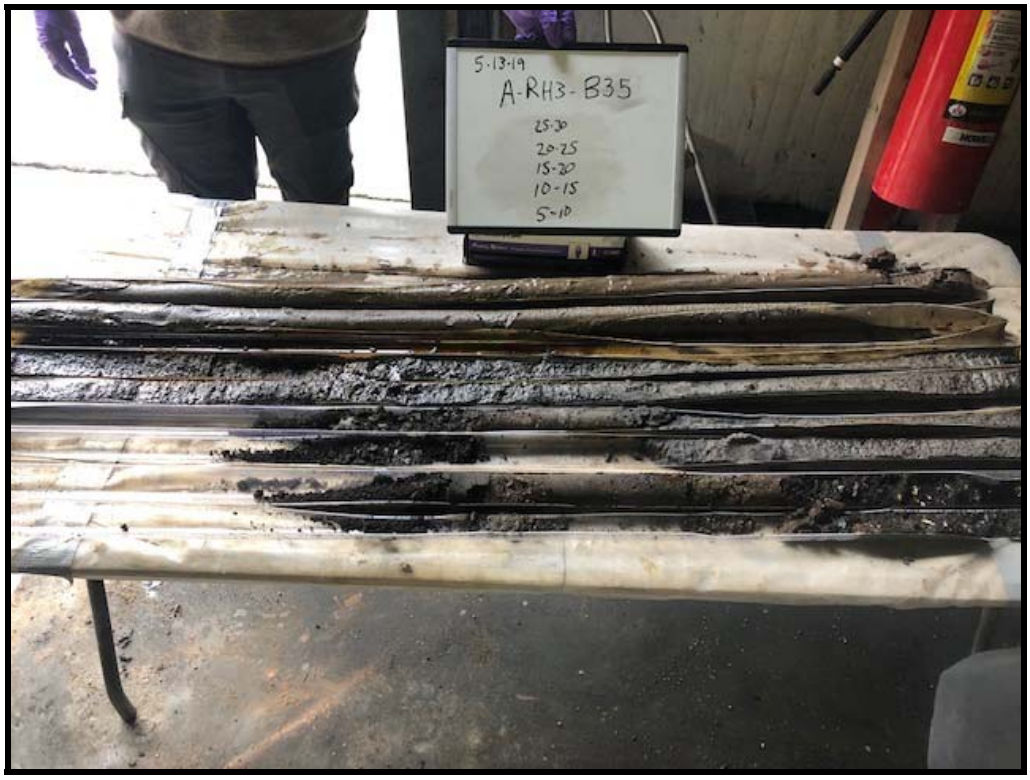
A-RH3-B31: 5- to 20-Foot Soil Cores (Refusal at 20 Feet)

A-RH3-B32: 5- to 30-Foot Soil Cores

A-RH3-B32: Close-up of Staining and Small Amount of NAPL in 15- to 20-Foot Interval

A-RH3-B33: 5- to 30-Foot Soil Cores

A-RH3-B34: 5- to 30-Foot Soil Cores



A-RH3-B35: 5- to 30-Foot Soil Cores

A-RH3-B35: Close-up of Golden Brown NAPL at 16 to 16.5 Feet

A-RH3-B36: 5- to 30-Foot Soil Cores

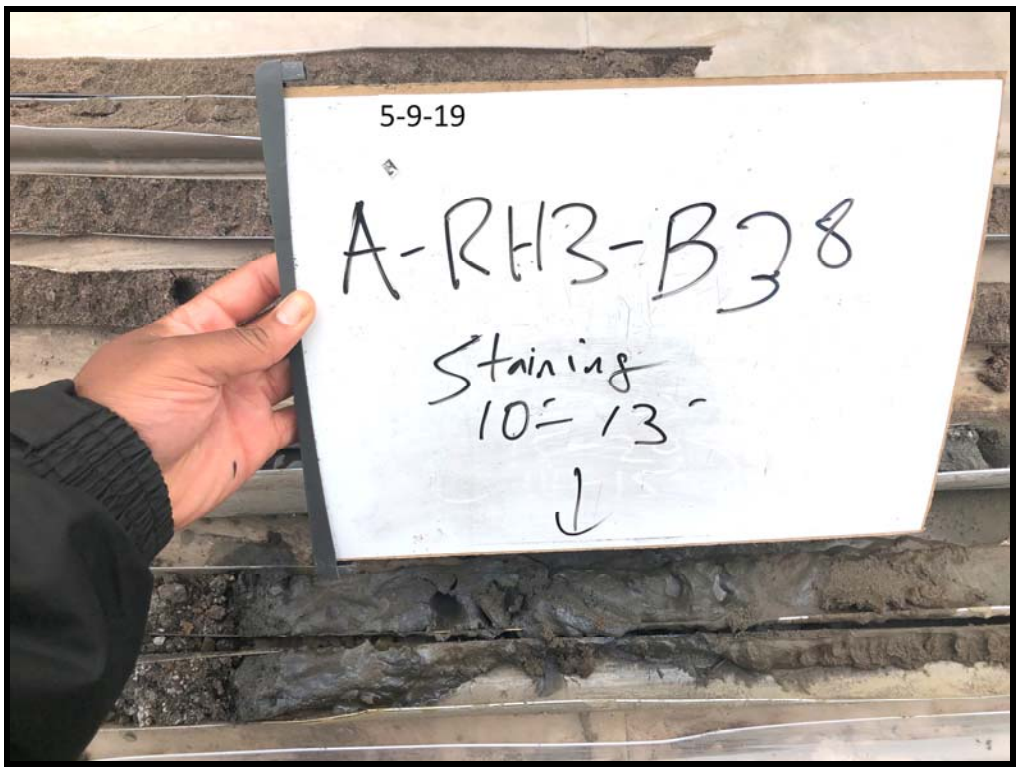
A-RH3-B36: Close-up of Staining from 20 to 30 Feet

A-RH3-B37: Concrete Core – Typical of Locations Inside Warehouse

A-RH3-B37: 5- to 30-Foot Soil Cores

A-RH3-B37: Close-up of Sheen and Staining at 15 to 17.5 Feet

A-RH3-B38: 5- to 30-Foot Soil Cores



A-RH3-B38: Staining at 10 to 13 Feet

A-RH3-B39: 5- to 30-Foot Soil Cores with Iridescence and Staining at 7 to 15 Feet

A-RH3-B39: Close-up of NAPL in 20- to 23-Foot Interval

A-RH3-B40: 5- to 30-Foot Soil Cores with Sheen 7 to 19 Feet and Staining 19 to 28 Feet

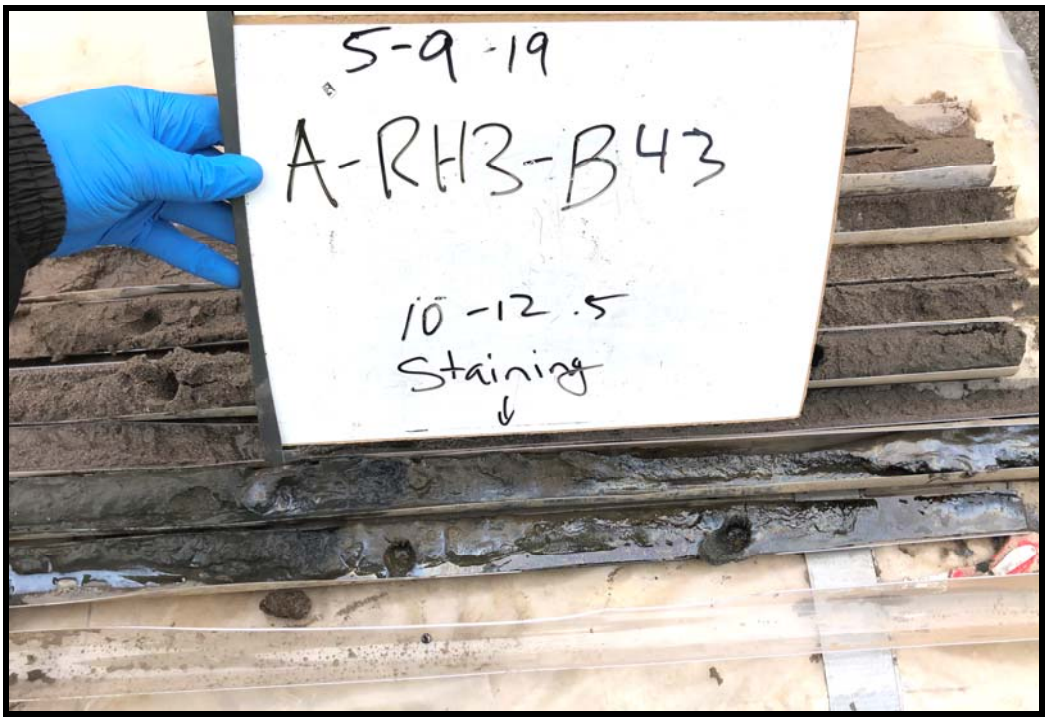
A-RH3-B41: 5- to 30-Foot Soil Cores

A-RH3-B41: Staining at 20 to 21 Feet

A-RH3-B42: NAPL at 15 to 18 Feet

A-RH3-B42: Close-up of NAPL at 15 to 18 Feet

A-RH3-B43: 5- to 30-Foot Soil Cores



A-RH3-B43: Heavy Staining at 10 to 12.5 Feet

A-RH3-B44: 5- to 25-Foot Soil Cores (Refusal at 25 Feet)

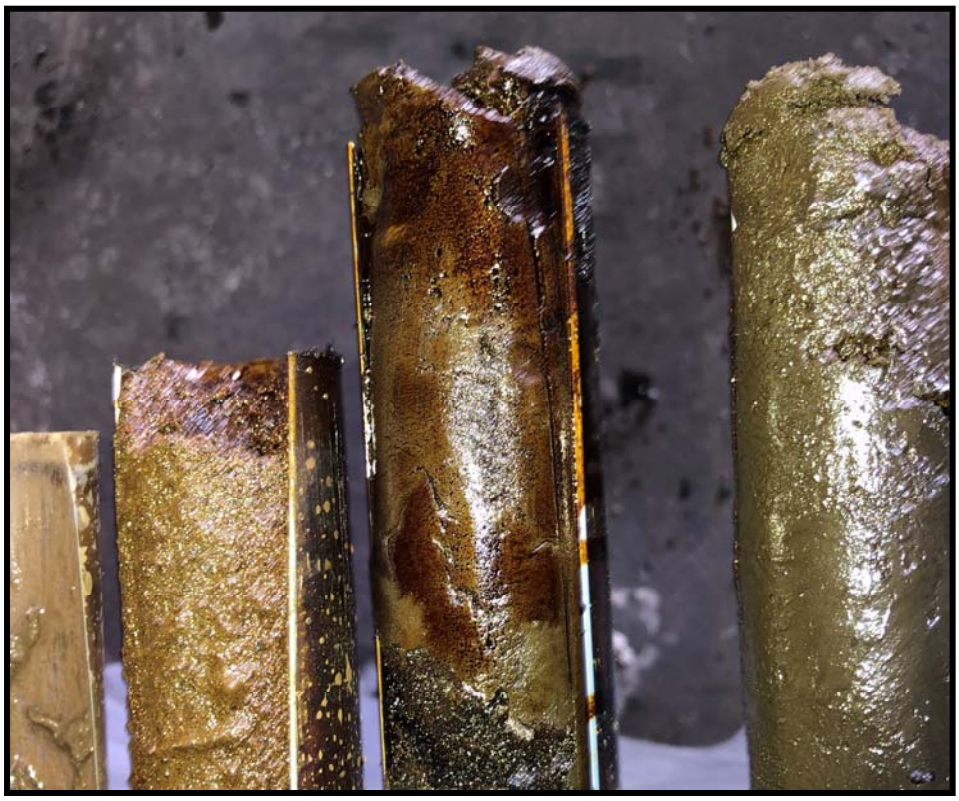
A-RH3-B44: Showing Close-up of Staining in a Portion of 13.5- to 25-Foot Interval

A-RH3-WS13: 5- to 15-Foot Soil Cores

A-RH3-WS13: 15- to 20-Foot Soil Core

A-RH3-WS13: 20- to 30-Foot Soil Cores

A-RH3-WS14: 5- to 30-Foot Soil Cores with Staining from 15 to 30 Feet



A-RH3-WS14: Close-up of NAPL at 19 to 20 Feet

A-RH3-WS15: 5- to 25-Foot Soil Cores

A-RH3-WS15: Close-up of NAPL in 23- to 24-Foot Interval

A-RH3-WS16: 5- to 30-Foot Soil Cores

A-RH3-WS16: Close-up of Staining in 20- to 25-Foot Interval

A-RH3-WS17: 5- to 30-Foot Soil Cores

A-RH3-WS17: NAPL at 20 to 23 Feet

A-RH3-WS17: Close-up of NAPL at 20 to 23 Feet and Staining at 25 to 27 Feet

A-RH3-WS18: 5- to 20-Foot Soil Cores

A-RH3-WS18: 20- to 30-Foot Soil Cores Showing Stained Soil and Liner at 20 to 25 Feet

A-RH3-WS19: 5- to 25-Foot Soil Cores Showing Staining 11 to 17 Feet

A-RH3-WS19: 20- to 30-Foot Soil Cores Showing Staining at 20 to 29 Feet

A-RH3-WS19: NAPL at 19 to 20 Feet

A-RH3-WS20: 10- to 25-Foot Soil Cores

A-RH3-WS20: Close-up of NAPL at 15 to 16 Feet and 22 to 27 Feet

A-RH3-WS21: 5- to 30-Foot Soil Cores

A-RH3-WS21: Close View 1 with Staining at 17 to 23 Feet and 25 to 28 Feet

A-RH3-WS21: Close View 2

A-RH3-WS22: 0- to 25-Foot Soil Cores (Refusal at 22 Feet)

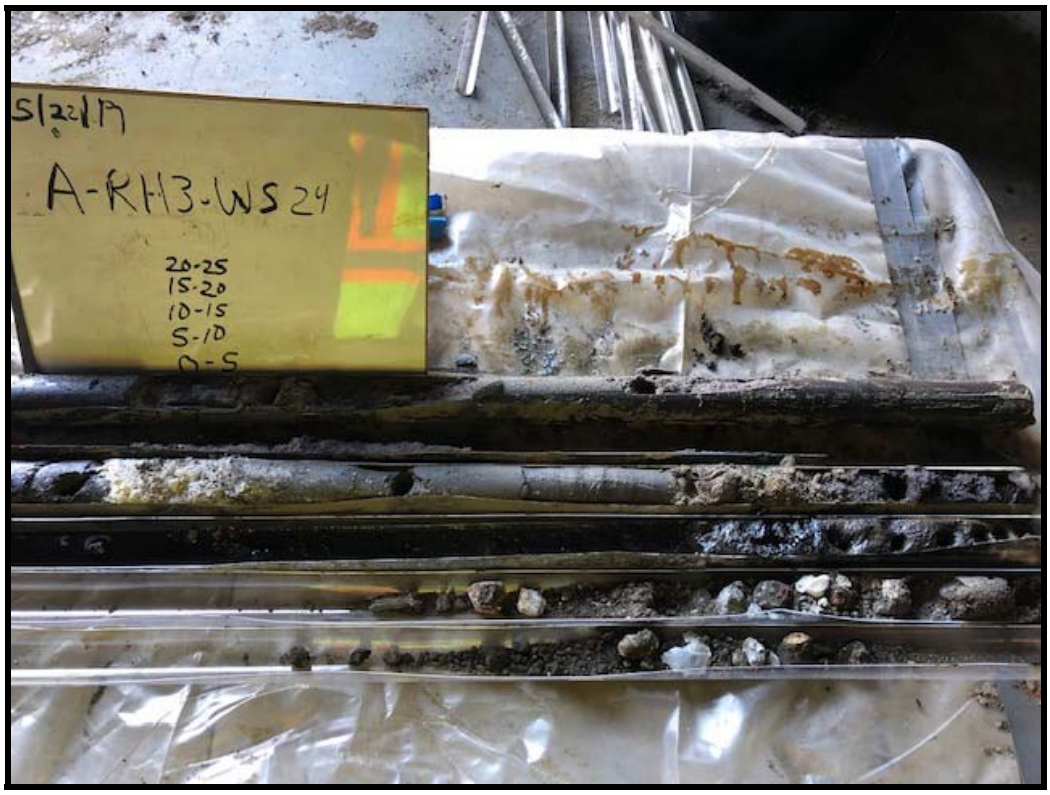
A-RH3-WS22: Close-up of NAPL at 20 to 21 Feet (Upper Sleeve)

A-RH3-WS23: 5- to 30-Foot Soil Cores

A-RH3-WS23: Close-up of Blebs at 15 to 16.5 Feet

A-RH3-WS24: 5- to 25-Foot Soil Cores

A-RH3-WS24: 5- to 25-Foot Close View 1



A-RH3-WS24: 5- to 25-Foot Close View 2

A-RH3-WS24: 20- to 30-Foot Soil Cores

A-RH3-WS24: NAPL at 10 to 11 Feet (Middle Sleeve)

A-RH3-WS25: 5- to 30-Foot Soil Cores

A-RH3-WS25: Close-up of NAPL at 15 to 17.5 Feet (Middle Sleeve)

A-RH3-WS26: 5- to 20-Foot Soil Cores

A-RH3-WS26: 20- to 30-Foot Soil Cores

A-RH3-WS26: Staining at 20 to 22 Feet (Lower Sleeve)
and Blebs 25 to 28 Feet (Upper Sleeve)

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau A
625 Broadway, 12th Floor, Albany, NY 12233-7015
P: (518) 402-9625 I F: (518) 402-9627
www.dec.ny.gov

August 27, 2019

Mr. Terry Young
ARCADIS of New York
One Lincoln Center, Suite 300
110 West Fayette Street
Syracuse, New York 13202

Re: Red Hook 3 Revised IRM Design Work Plan Comments
Red Hook 3 – NYSDEC Brownfield Site #C224213
68 and 100 Ferris Street, 242 and 300 Coffey St.
Brooklyn, Kings County, New York 11231

Dear Mr. Young

The following comments are in response to our on-going conversation regarding the excavation limits and the 7/9/19 revised IRM design workplan for the Red Hook 3 properties.

- The current planned excavation limits do not address all the NAPL source material that was identified during the confirmation soil boring event. The current proposal only addresses NAPL down to 15 ft outside the metal warehouse and 18 ft inside the area of the metal warehouse for various reasons, most prevalent being limitations given the amount of dewatering required.

  Based upon the definition of a source material in DER-10 the contamination identified during the investigation and subsequent boring confirmation investigation meets the definition of a source. The photologs depict flowing NAPL product or grossly contaminated media. Other factors which the Department considers make it necessary to address NAPL to the extent feasible is that it continues to be a source to groundwater contamination and maybe migrating offsite.

  The 15-foot depth of excavation limit does not apply. The regulations specifically state that contaminant specific SCOs for all soils above bedrock shall not apply at a depth greater than 15 feet bgs provided that:

  (1) soils below 15 feet do not represent a source

  The planned excavation addresses only the upper 15 ft. of NAPL source area leaving additional source material at greater depths. The following borings identified NAPL source material that would remain un-remediated. This constant

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source of groundwater contamination will require long term monitoring and possible additional remedial action (in addition to institutional controls).

A-RH3-B27 (15-18.5 ft), A-RH3-B39 (20-23 ft), A-RH3-DB3 (17.5-17.9 ft), A-RH3-WS14 (19-20 ft), A-RH3-WS15 (18-19 and 23-24 ft), A-RH3-WS17 (20-23 ft), A-RH3-WS19 (19-20 ft), A-RH3-B1 (18-20 ft), A-RH3-B2 (18-19.5 ft), A-RH3-B32 (18-20 ft), A-RH3-WS20 (22-27 ft), A-RH3-WS22 (20-21 ft

A fundamental remedial goal and baseline consideration found in the Remedy Selection Chapter of DER 10 states that an identifiable source of contamination shall be addressed by the remedial program. It then describes a hierarchy of preference with removal and/or treatment of NAPL and grossly contaminated media being first. Groundwater contamination must also be addressed by the remedial program with source removal and control being preferred.

If you have any questions, feel free to contact me at 518-402-0163 or at chris.heller@dec.ny.gov.

Sincerely,

Chris Heller
Project manager
Remedial Bureau A
Division of Environmental Remediation

Ecc: H. Devery, ARCADIS
C. Geraci, ARCADIS
R. DeCandia, NYSDEC
E. Obrecht, NYSDEC
J. O'Connell, NYSDEC Region 2
J. Deming / W. Kuehner, NYSDOH

ARCADIS Design & Consultancy for natural and built assets

Mr. Chris Heller
Project Manager
New York State Department of Environmental Conservation
Remedial Bureau A, Section B
Division of Environmental Remediation
625 Broadway, 12th Floor
Albany, NY 12233-7015

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017
www.arcadis.com

Subject:
Monitoring Well Decommissioning
Red Hook 3
68 and 100 Ferris Street, 242 and 300 Coffey Street, Brooklyn, New York
Brownfield Cleanup Program (BCP) #224213

ENVIRONMENT

Date:
August 30, 2019

Contact:
Andrew Korik

Phone:
315 671 9323

Email:
Andrew.Korik@arcadis.com

Our ref:
30004527

Dear Mr. Heller:

On behalf of BT Red Hook, LLC, Arcadis of New York, Inc. (Arcadis) hereby presents this summary of monitoring well decommissioning associated with the above-referenced site. On May 6 and May 8, 2019, all on-site wells (**Table 1 and Figure 1**) were decommissioned in accordance with New York State Department of Environmental Conservation (NYSDEC) CP-43 *(Groundwater Monitoring Well Decommissioning Policy,* dated November 2009*)* and our letter to NYSDEC dated April 17, 2019. The letter was approved by NYSDEC in an email dated April 29, 2019. Note that all wells were grouted on May 6, with removal of curb boxes and completion of surface restorations on May 8.

Grouting of Wells – Twenty-two monitoring wells, each of 2-inch diameter PVC construction, were decommissioned using the grouting in-place well decommissioning method identified in CP-43, which required tremie-grouting a cement-bentonite grout mixture from the bottom up. Due to difficulty pumping the grout, additional water was used in the mix. Potable water for grouting was provided by Arcadis' well decommissioning subcontractor, EnviroTrac, which obtained the water from the municipal water supply at their office in Yaphank (Suffolk County), New York. After emplacing cement-bentonite grout, the upper 3 to 4 feet of the PVC well riser was extracted from the ground at MW-2 and MW-3; however, the PVC risers were found to be encased in cement up into the curb-boxes at the remaining 20 locations and thus the top of the PVC risers was not removed. CP-43 forms are provided in **Attachment 1**, and a photolog is provided in **Attachment 2**. After grouting the screens and risers, the flush-mounted curb boxes were removed using a jackhammer or crowbar, the void space filled to

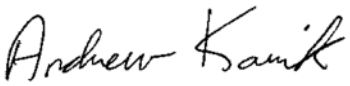
grade with concrete, and the surface restored consistent with the surrounding surface material (e.g., cold-patch).

Management of Waste – Concrete and asphalt generated during the decommissioning activities were staged on site for later disposal as demolition debris. Metal and PVC debris were managed by EnviroTrac as municipal solid waste and disposed off site.

Should you have any questions regarding the well decommissioning, please do not hesitate to contact me at 315.671.9323 or Andrew.korik@arcadis.com.

Sincerely,

Arcadis of New York, Inc.



Andrew Korik
Principal Scientist

Copies:
Moniqua Williams, BT Red Hook, LLC
Hugh Devery, Arcadis

Enclosures:

Table

1 Monitoring Well Decommissioning Details

Figure

1 Monitoring Well Decommissioning

Attachments

1 Well Decommissioning Logs (CP-43 Forms)
2 Photolog

TABLE

Table 1
Monitoring Well Decommissioning Details

ARCADIS Design & Consultancy for natural and built assets

BT Red Hook, LLC – Red Hook 3
68 and 100 Ferris Street/242 and 300 Coffey Street
Brooklyn, New York

RED HOOK 3 MONITORING WELLS DECOMMISSIONED ON MAY 6, 2019	
Well ID	**Measured Depth to Bottom of Well(feet bgs)**
LMW-1	14.78
LMW-2	20.78
LMW-3	14.51
LMW-4	19.08
LMW-5	19.42
LMW-6	16.69
LMW-7S	17.60
LMW-7D	48.46
LMW-8S	19.60
LMW-8D	71.04
MW-9S	18.02
MW-9D	48.68
MW-10S	19.66
MW-10D	45.98
MW-11S	16.24
MW-11D	50.69
MW-12S	15.64
MW-12D	50.46
MW-1	15.05
MW-2	15.15
MW-3	13.25
TMW-1	19.32

Notes:
bgs - below ground surface
Wells were grouted on May 6, 2019. Well pads were removed and the surface patched on May 8.

FIGURE

LEGEND:

- DECOMMISSIONED MONITORING WELL
- SITE BOUNDARY
- FENCE
- UTILITY POLES

NOTES:

1. MONITORING WELL LOCATIONS AND PHYSICAL FEATURES BASED ON SURVEYS CONDUCTED BY DPK LAND SURVEYING, LLC ON OCTOBER 27, 2017 AND SEPTEMBER 26, 2018.
2. PROPERTY BOUNDARIES OBTAINED FROM FIGURE ENTITLED “ALTA/NSPS LAND TITLE SURVEY” (LANGAN APRIL 4, 2017)
3. MONITORING WELL DECOMMISSIONING WAS CONDUCTED BY ARCADIS ON MAY 6 AND MAY 8, 2019, IN ACCORDANCE WITH THE NYSDEC-APPROVED MONITORING WELL DECOMMISSIONING PLAN DATED APRIL 17, 2019 AND NYSDEC’S CP-43: GROUNDWATER MONITORING WELL DECOMMISSIONING POLICY.”

0 100' 200'

GRAPHIC SCALE

BT RED HOOK, LLC - RED HOOK 3
68 AND 100 FERRIS STREET/242 AND 300 COFFEY STREET
BROOKLYN, NEW YORK

MONITORING WELL DECOMMISSIONING

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

ATTACHMENT 1

Well Decommissioning Logs (CP-43 Forms)

FIGURE 1

SITE NAME: Arcalis - Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR: MW
DATE/TIME: 04/06/19/1200
WELL ID.: LMW-1

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: LMW-1

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED	—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)	metal
PROTECTIVE CASING MATERIAL TYPE:	Metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):	8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):	14.78
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):	4.42
MEASURE WELL DIAMETER (Inches):	2"
WELL CASING MATERIAL:	PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:	good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE	—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES	—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Behind security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

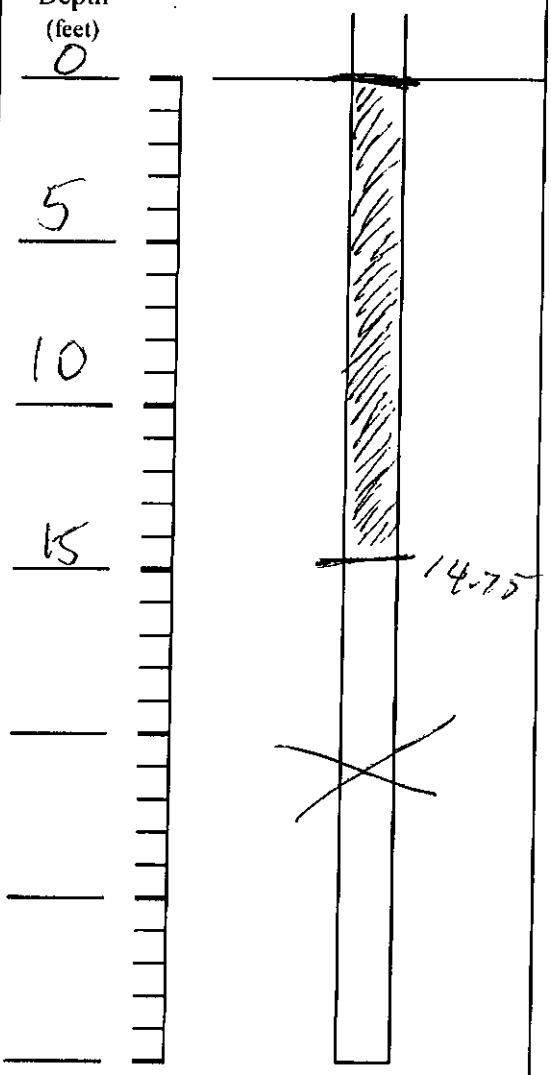
WELL DECOMMISSIONING RECORD

Site Name: Arcadis – Red Hook #3	Well I.D.: CMW-1
Site Location: 68 Ferris St. Brooklyn, NY	Driller:
Drilling Co.: Enviroware	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools
Casing retrieved (feet)	–
Casing type/dia. (in)	PVC / 2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0 – 14.75
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10 – 15
Quantity of calcium chloride used (lbs.)	–
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	8 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

SITE ID.: Red Hook # 3
INSPECTOR: MW
DATE/TIME: 05/06/09/1232
WELL ID.: LMW-2

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: LMW-2

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED	—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)	Manhole
PROTECTIVE CASING MATERIAL TYPE:	Metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):	5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)	✓	
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):	20.78
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):	6.65
MEASURE WELL DIAMETER (Inches):	2"
WELL CASING MATERIAL:	PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:	Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE	—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES	—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Behind security gate, Behind building.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

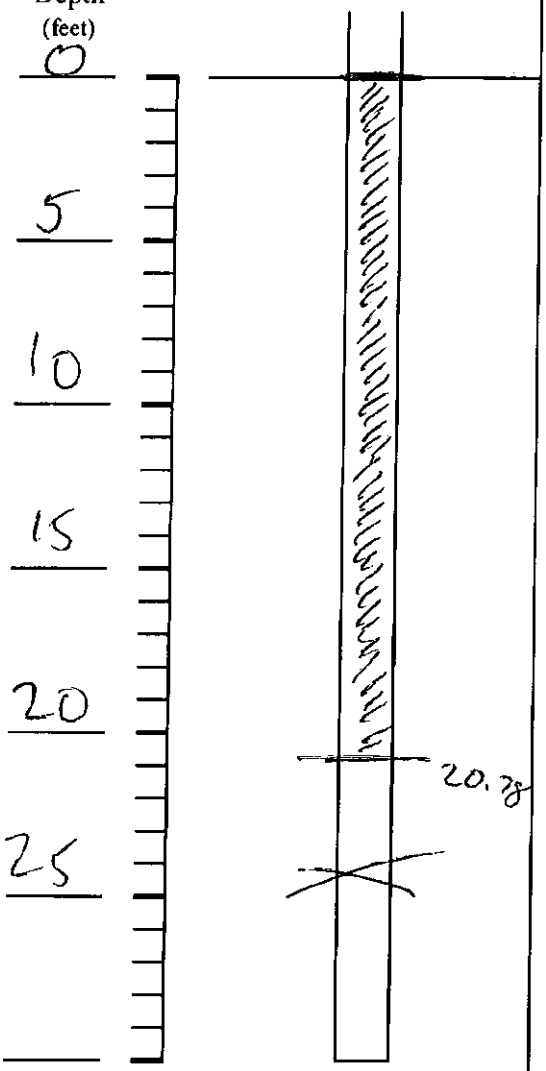
WELL DECOMMISSIONING RECORD

Site Name: Arcuris - Red Hook #3.	Well I.D.: LMW-2
Site Location: 68 Ferris St. Brooklyn NY	Driller:
Drilling Co.: Environtrac	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools
Casing retrieved (feet)	
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-20.78
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	12

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR: MM
DATE/TIME: 05/06/19/1245
WELL ID.: CMW-3

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: CMW-3

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Manhole

PROTECTIVE CASING MATERIAL TYPE: ~~PVC~~ metal

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 14.51

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 5.83

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Behind security fence, behind building.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

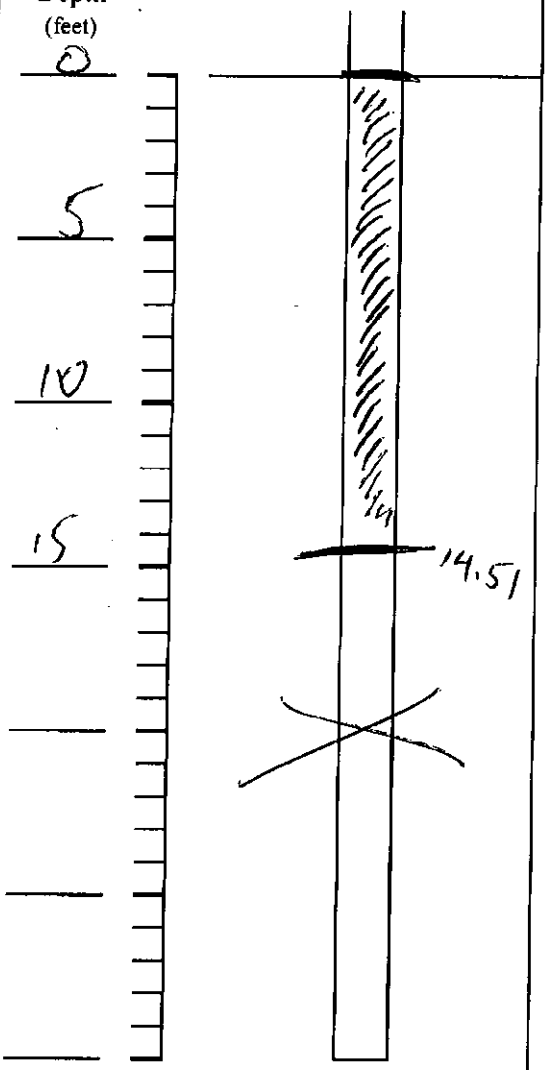
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: LMW-3
Site Location: 608 Ferris St. Brooklyn NY	Driller:
Drilling Co.: Envirotrac	Inspector: MW
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools
Casing retrieved (feet)	-
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0 - 14.51
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	230
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	8gal

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook 417

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

SITE ID.: ~ Red Hook 417
INSPECTOR: MW
DATE/TIME: 05/28/19
WELL ID.: CMW-4

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: CMW-4

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED	—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)	~~flush~~ manhole
PROTECTIVE CASING MATERIAL TYPE:	metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):	8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):	19.08
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):	4.42
MEASURE WELL DIAMETER (Inches):	2"
WELL CASING MATERIAL:	PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:	Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE	—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES	—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Road, behind security gate, behind brick building.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

—

FIGURE 3

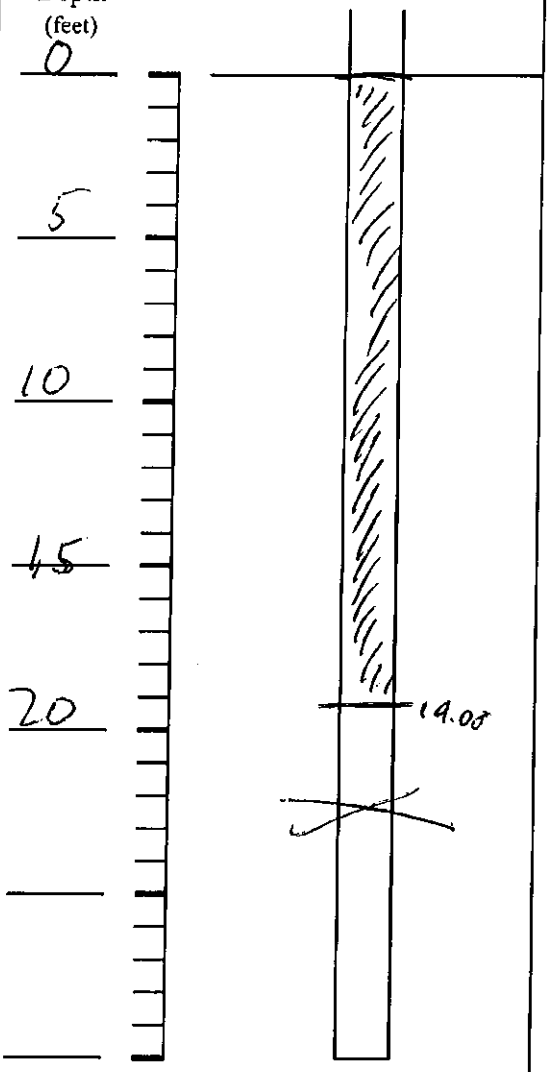
WELL DECOMMISSIONING RECORD

Site Name: Arcadis Redhook #3	Well I.D.: CMW-4
Site Location: 68 Ferris St, Brooklyn NY	Driller:
Drilling Co.: Environdrill	Inspector: [illegible]
	Date: 05/06/09

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand Tools
Casing retrieved (feet)	—
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0 - 19.08
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	—
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	11 gal

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis-Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR: mw
DATE/TIME: 05/06/19 / 1222
WELL ID.: CMW-5

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: CMW-5

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED	—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)	Manhole
PROTECTIVE CASING MATERIAL TYPE:	metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):	8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)	✓	
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):	19.42
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):	7.19
MEASURE WELL DIAMETER (Inches):	2"
WELL CASING MATERIAL:	PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:	Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE	—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES	—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Behind Security gate, Behind building.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

REMARKS:

FIGURE 3

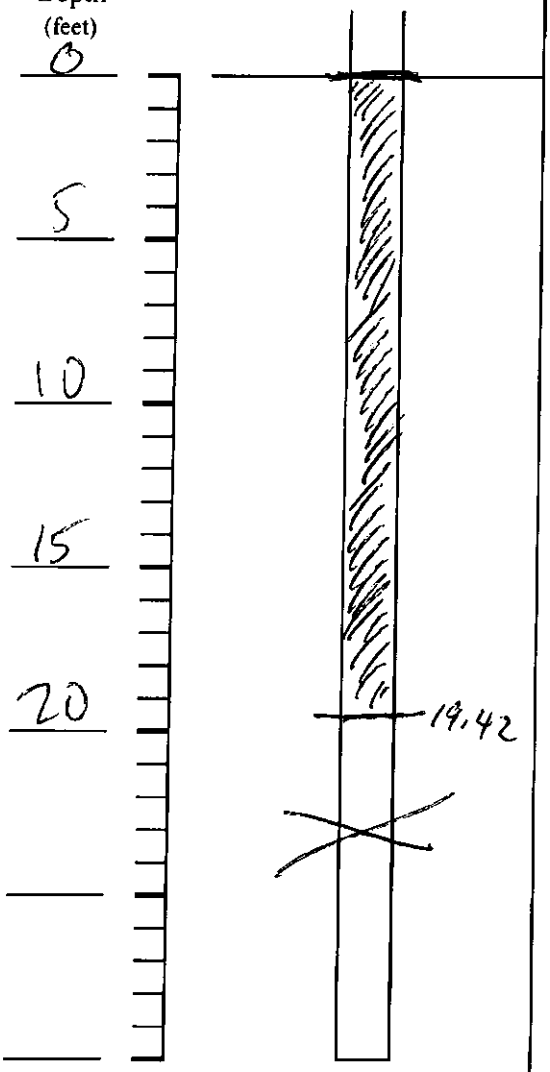
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: LMW-5
Site Location: 68 Ferris St. Brooklyn NY	Driller:
Drilling Co.: Environmental	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools
Casing retrieved (feet)	-
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-19.42
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	12 gal

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR:
DATE/TIME: 05/06/14/1120
WELL ID.: LMW-6

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: LMW-6

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Manhole

PROTECTIVE CASING MATERIAL TYPE: Metal

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)	✓	
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 16.69

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 9.46

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Inside Security gate; Inside Brick Building.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

✓

FIGURE 3

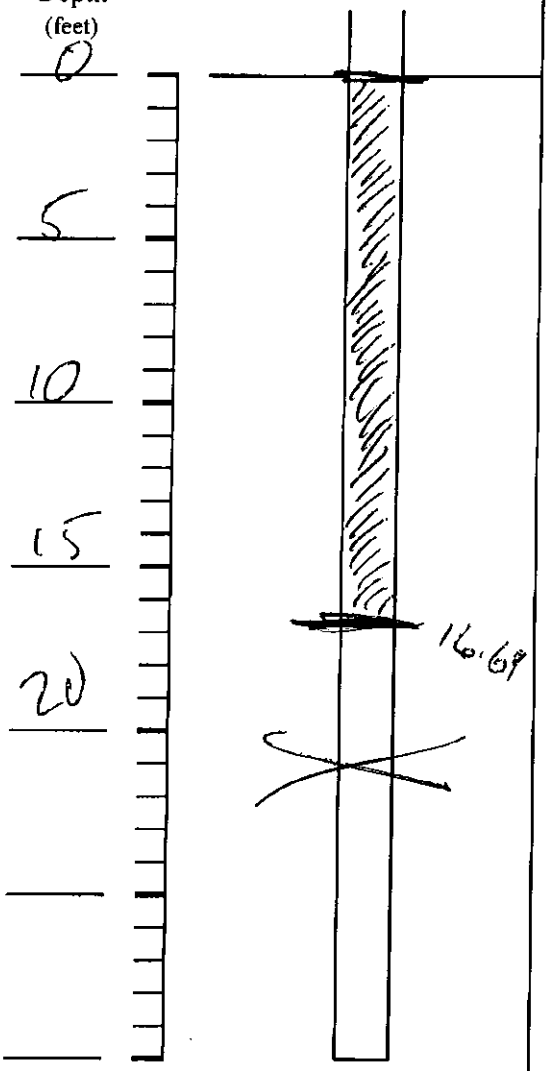
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: CMW-6
Site Location: 68 Ferris St. Brooklyn NY	Driller:
Drilling Co.: Enviro Trac	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools.
Casing retrieved (feet)	-
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-16.69
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	0 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR: [illegible]
DATE/TIME: 09/06/19 0410
WELL ID.: LMW-7S

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: LMW-7S

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Manhole
PROTECTIVE CASING MATERIAL TYPE: metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 17.60
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 4.42
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

On-site - inside metal Building.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

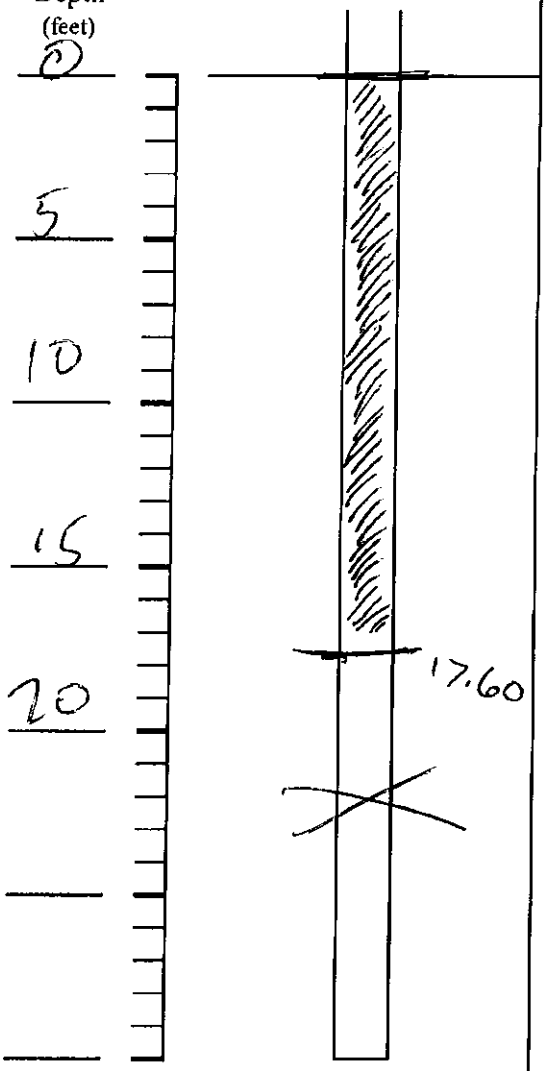
WELL DECOMMISSIONING RECORD

Site Name: Arcadis Railroad #3	Well I.D. LMW-7S
Site Location: 68 Ferris Crossing NY.	Driller:
Drilling Co.: Environtrac	Inspector: mm
	Date: 05/06/19.

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools.
Casing retrieved (feet)	-
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-17.60
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	9 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR: MM
DATE/TIME: 05/06/19 0928
WELL ID.: LMW-7D

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: LMW-7D

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): manhole
PROTECTIVE CASING MATERIAL TYPE: Metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 48.46
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 9.32
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Onsite - inside metal building

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

✓

REMARKS:

FIGURE 3

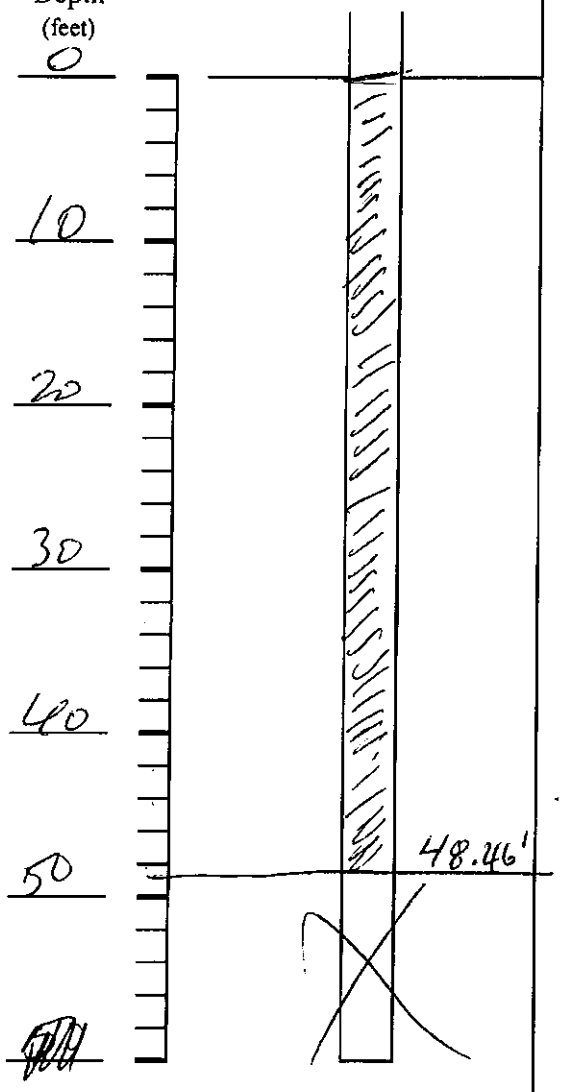
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: CMW-7D
Site Location: 68 Ferris St., Brooklyn, NY	Driller:
Drilling Co.: EnviroTrac Ltd.	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand feds
Casing retrieved (feet)	—
Casing type/dia. (in)	PVC / 2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-48.46'
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15 lbs
Quantity of calcium chloride used (lbs.)	—
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	36

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Ariadis - Red Rock #3

SITE ID.: Red Rock #3
INSPECTOR: MVM
DATE/TIME: 05/06/14 0843
WELL ID.: LMW-8S

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: LMW-8S

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)		

HEADSPACE READING (ppm) AND INSTRUMENT USED	—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)	manhole
PROTECTIVE CASING MATERIAL TYPE:	metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):	8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)	✓	
WELL MEASURING POINT VISIBLE?		

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):	19.60
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):	9.46
MEASURE WELL DIAMETER (Inches):	2"
WELL CASING MATERIAL:	PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:	Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE	—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES	—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Onsite, inside metal building.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

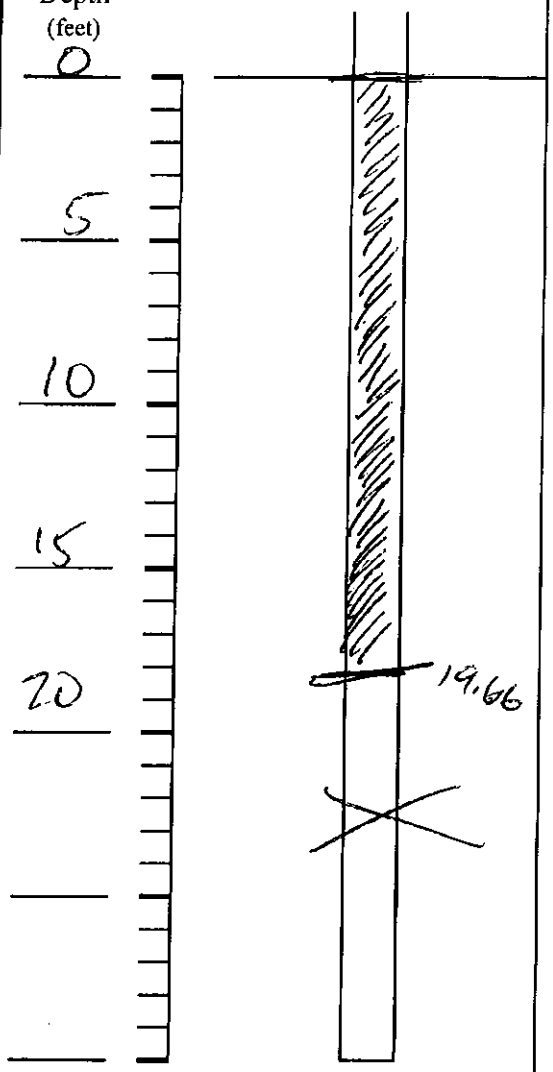
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Ralph Hook #3	Well I.D.: LMW-8S
Site Location: 69 Ferris St. Brooklyn NY.	Driller:
Drilling Co.: Enviroteq	Inspector: MM
	Date: 05/06/12

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools.
Casing retrieved (feet)	—
Casing type/dia. (in)	PVC - 2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-19.66
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	—
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	12 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

SITE NAME: Arcadis - Red Hook #3 FIGURE 1

SITE ID.: Redhook #3
INSPECTOR: MVM
DATE/TIME: 09/09/19 0856
WELL ID.: LMW-8D

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: LMW-8D

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED	—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)	manhole.
PROTECTIVE CASING MATERIAL TYPE:	metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):	5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):	71.04
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):	9.20
MEASURE WELL DIAMETER (Inches):	2"
WELL CASING MATERIAL:	PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:	Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE	—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES	—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

On site, inside metal building.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

✓

REMARKS:

FIGURE 3

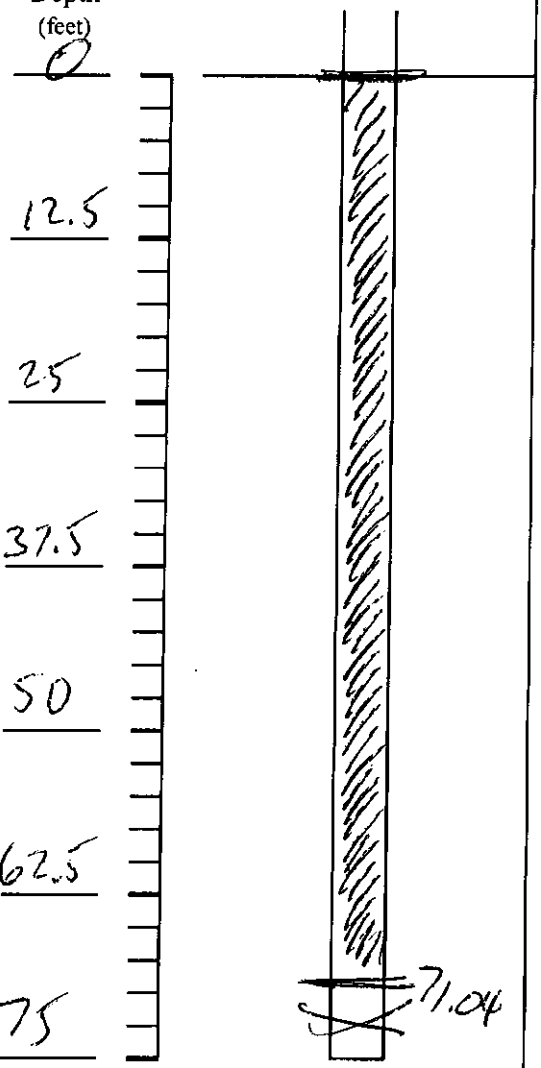
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: LMW-8D
Site Location: 68 Ferris St. Brooklyn NY	Driller:
Drilling Co.: Enviroflex	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand Tools
Casing retrieved (feet)	—
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-71.04
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	—
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	38 gal

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Ariola - Red Hook II J

SITE ID.: Red Hook #3
INSPECTOR: mm
DATE/TIME: 05/20/19 1002
WELL ID.: MW-9S

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO	
WELL VISIBLE? (If not, provide directions below)	✓		
WELL I.D. VISIBLE?	✓		
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓		
WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL:			MW-9S
SURFACE SEAL PRESENT?	✓		
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓		
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓		
HEADSPACE READING (ppm) AND INSTRUMENT USED			—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)			Manhole
PROTECTIVE CASING MATERIAL TYPE:			Metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):			5"
LOCK PRESENT?	✓		
LOCK FUNCTIONAL?		✓	
DID YOU REPLACE THE LOCK?		✓	
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓	
WELL MEASURING POINT VISIBLE?	✓		
MEASURE WELL DEPTH FROM MEASURING POINT (Feet):			18.02
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):			6.52
MEASURE WELL DIAMETER (Inches):			2"
WELL CASING MATERIAL:			PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:			Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE			—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES			—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Good, Behind Security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

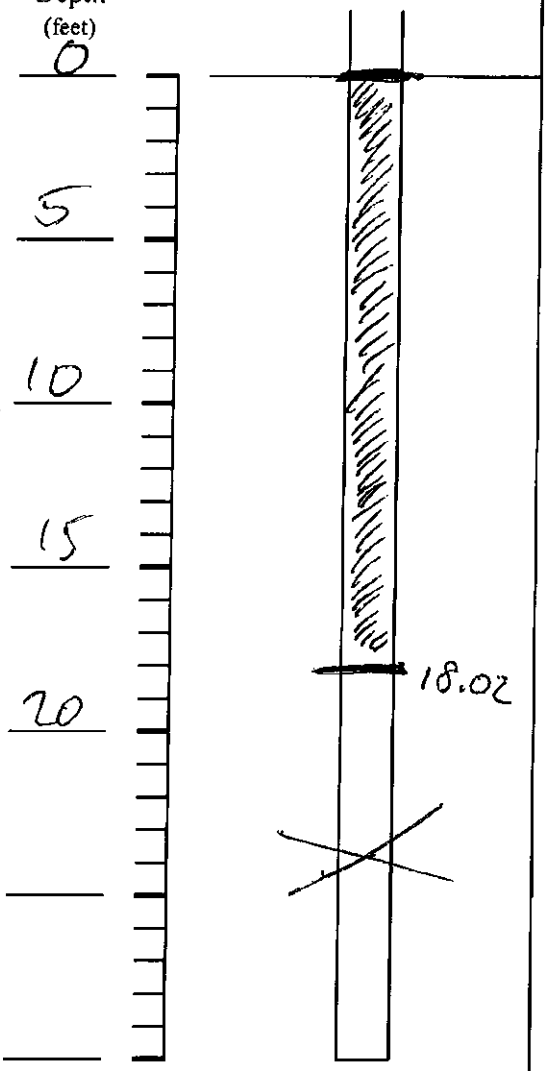
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: MW-9S
Site Location: 68 Ferris St & Brooklyn NY.	Driller:
Drilling Co.: Environtrac	Inspector: Mary
	Date: 05/06/10

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools
Casing retrieved (feet)	
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-18.02
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	10 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arnold's - Rail Hook (#3

SITE ID.: Rail Hook #3
INSPECTOR: MWW
DATE/TIME: 05/06/19 1016
WELL ID.: MW-9D

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-9D

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): manhole

PROTECTIVE CASING MATERIAL TYPE: metal

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)	✓	
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 48.68

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 7.46

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good.

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Good, Behind Security gate

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

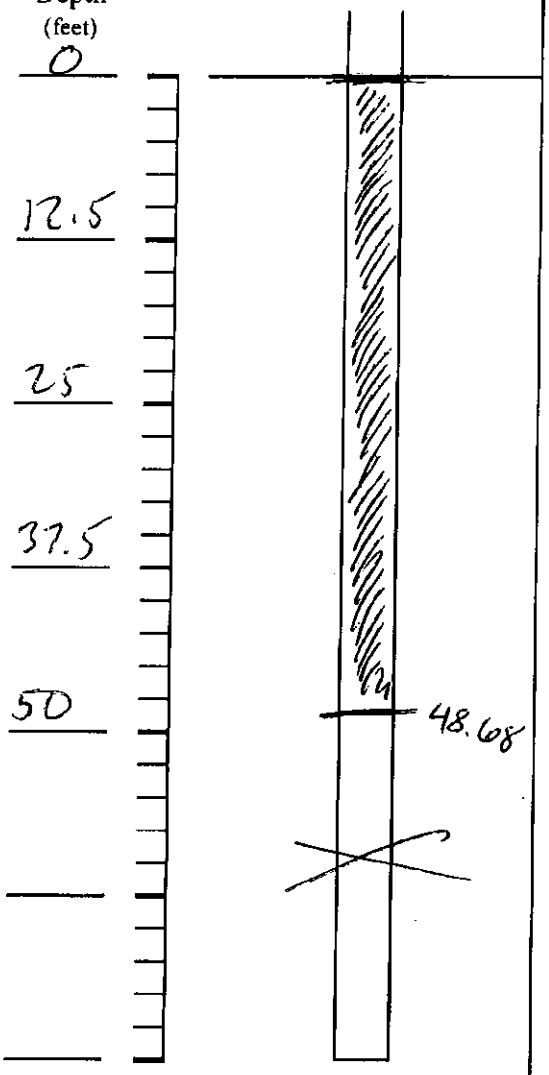
WELL DECOMMISSIONING RECORD

Site Name: Arrak's Red Hook #3	Well I.D.: MW-9D
Site Location: 68 Ferris Street, Brooklyn NY	Driller:
Drilling Co.: Envirotech	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools
Casing retrieved (feet)	—
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-48.68
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	—
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	28 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Redhook #3

SITE ID.: Redhook #3
INSPECTOR: MM
DATE/TIME: 05/06/14/0752
WELL ID.: MW-10S

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-10S

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Manhole

PROTECTIVE CASING MATERIAL TYPE: metal

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 19.66

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 5.01

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access good, behind security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

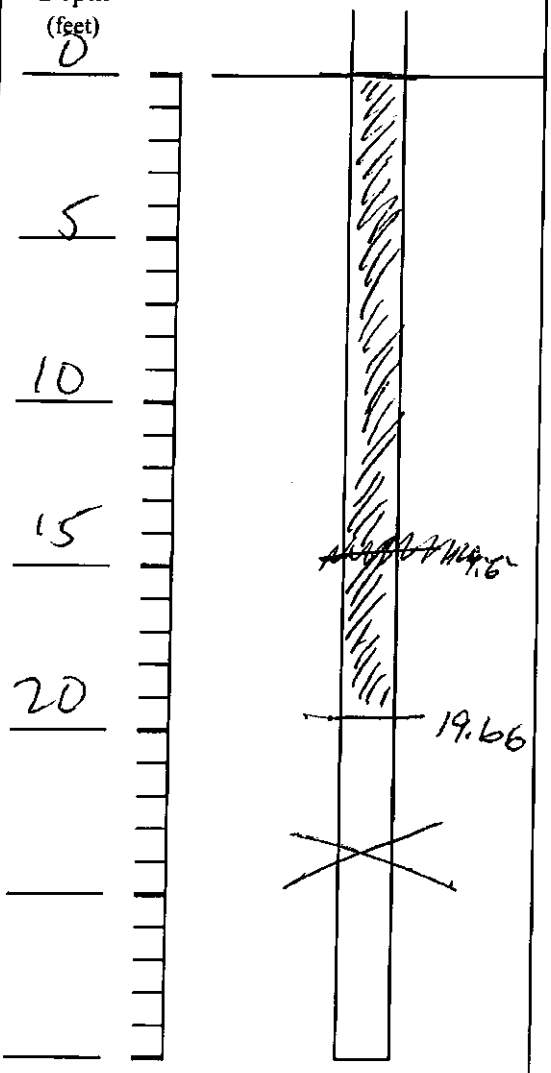
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook # 3	Well I.D.: MW-105
Site Location: 68 Ferris St. Brooklyn, N.Y.	Driller:
Drilling Co.: Enviroprac	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand Tools
Casing retrieved (feet)	-
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-19.66.
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	11 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcuri's - Red Hook # 3

SITE ID.: Red Hook #3
INSPECTOR: MM
DATE/TIME: 06/04/19 / 0810
WELL ID.: MW-10D

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW10D

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): manhole
PROTECTIVE CASING MATERIAL TYPE: metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 45.98
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 5.47
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Road, behind security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

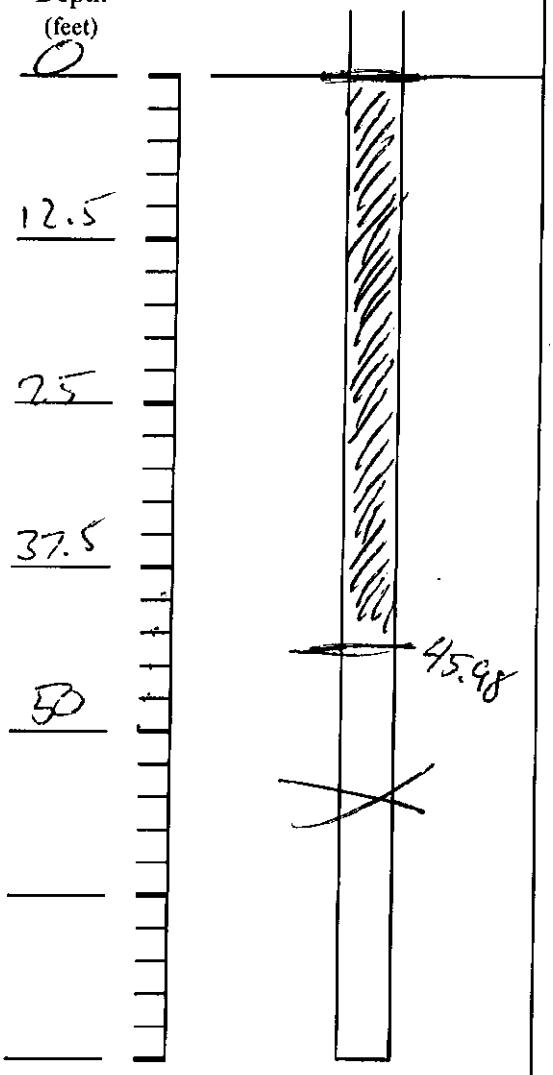
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Gulf Hook #3	Well I.D.: MW-10D
Site Location: 68 Ferris St. Brooklyn NY	Driller:
Drilling Co.: Environtrac	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand Tools
Casing retrieved (feet)	
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-45.98
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	25 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arvada - Red Rock #3

SITE ID.: Redrock #3
INSPECTOR: mm
DATE/TIME: 05/26/19/0934
WELL ID.: MW-11S

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-11S

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): manhole

PROTECTIVE CASING MATERIAL TYPE: metal

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)	✓	✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 16.24

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 4.56

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Good, behind Security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.): —

REMARKS:

FIGURE 3

WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Bedford # 3	Well I.D.: MW-115
Site Location: 68 Ferris St Brooklyn	Driller:
Drilling Co.: Enviroprac	Inspector: MW
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING

Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	

CASING PULLING

Method employed	Hand tools
Casing retrieved (feet)	—
Casing type/dia. (in)	PVC/2"

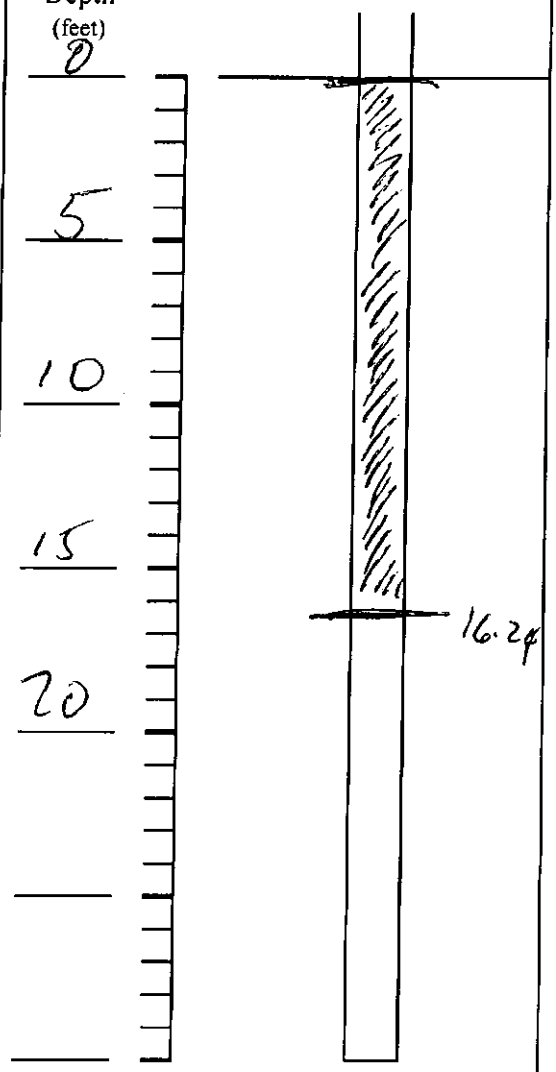
CASING PERFORATING

Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	

GROUTING

Interval grouted (FBLS)	0-16.24
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	—
Volume of grout prepared (gal.)	45 gal
Volume of grout used (gal.)	9 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

SITE ID.: RedHook#3
INSPECTOR: [illegible]
DATE/TIME: 05/06/98 [illegible]
WEll ID.: MW-11D

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-11D

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED	—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)	manhole
PROTECTIVE CASING MATERIAL TYPE:	metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):	5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):	50.69
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):	4.43
MEASURE WELL DIAMETER (Inches):	2"
WELL CASING MATERIAL:	PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:	Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE	—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES	—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Good, behind Security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

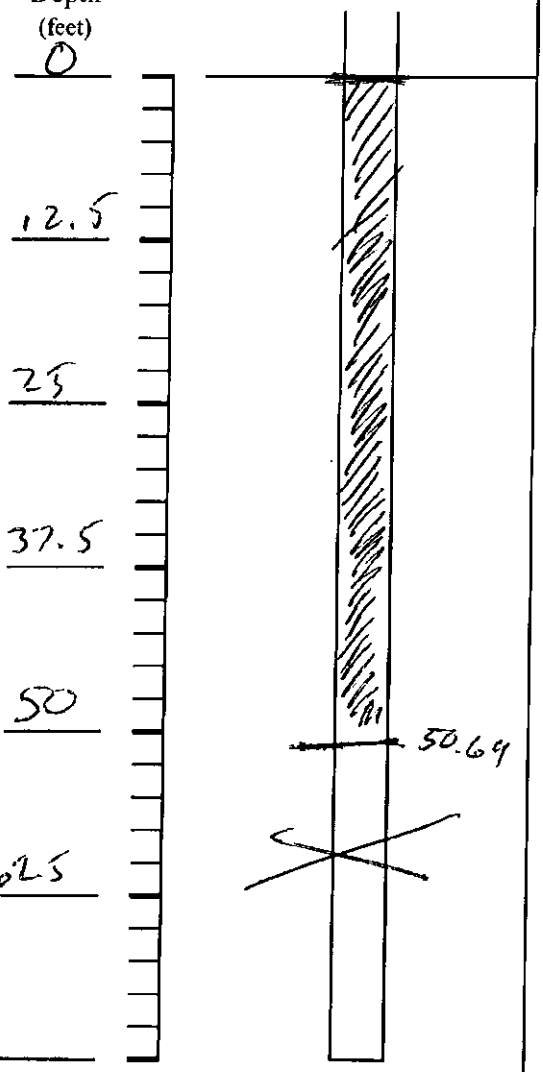
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: MW-11D
Site Location: 68 Imlay St. Brooklyn N.Y.	Driller:
Drilling Co.: Environtrac	Inspector: MM
	Date: 05/26/11

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools
Casing retrieved (feet)	
Casing type/dia. (in)	NA/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-50ft
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	28 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #5

SITE ID.: Red Hook #3
INSPECTOR: MW
DATE/TIME: 05/06/19 0738
WELL ID.: MW-12S

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-12S

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Manhole

PROTECTIVE CASING MATERIAL TYPE: metal

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 15.64

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 4.10

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access good, Ins. by Security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

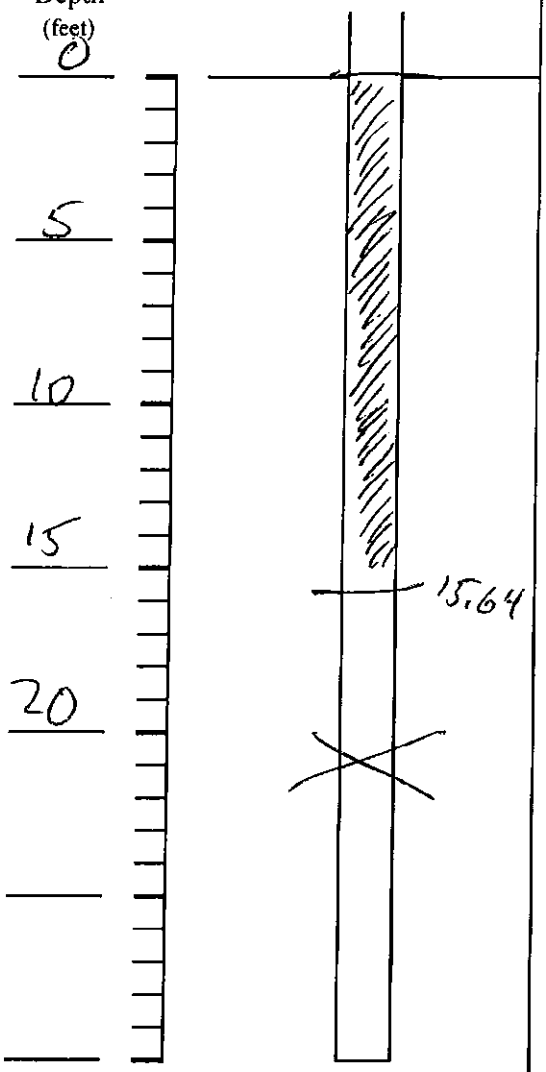
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: MW-12S
Site Location: 68 Ferris St. Brooklyn NY.	Driller:
Drilling Co.: Environtac	Inspector: MW
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand Tools.
Casing retrieved (feet)	
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-15.64
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	9 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR: MM
DATE/TIME: 05/06/09/0810
WELL ID.: MW-12D

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-12D

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Manhole

PROTECTIVE CASING MATERIAL TYPE: metal

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		✓
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)	✓	
WELL MEASURING POINT VISIBLE?		

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 50.46

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 5.00

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.) ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Road, Behind Security Gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

REMARKS:

FIGURE 3

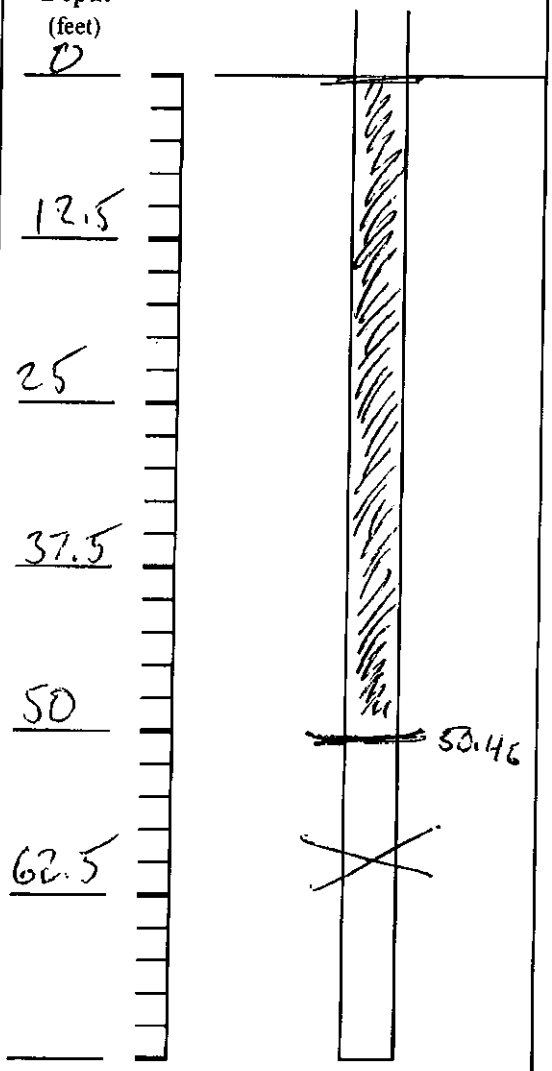
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: MW-12D
Site Location: 68 Ferris St. Brooklyn, NY.	Driller:
Drilling Co.: Envirobrat	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand Tools
Casing retrieved (feet)	—
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-50.46
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	—
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	28 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR: mw
DATE/TIME: 05/06/14 0812
WELL ID.: ~~MW-1~~ MW-1

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-1

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —

TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): manhole

PROTECTIVE CASING MATERIAL TYPE: Metal

MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 15.05

MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 5.10

MEASURE WELL DIAMETER (Inches): 2"

WELL CASING MATERIAL: PVC

PHYSICAL CONDITION OF VISIBLE WELL CASING: Good

ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —

PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Good, behind Security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

FIGURE 3

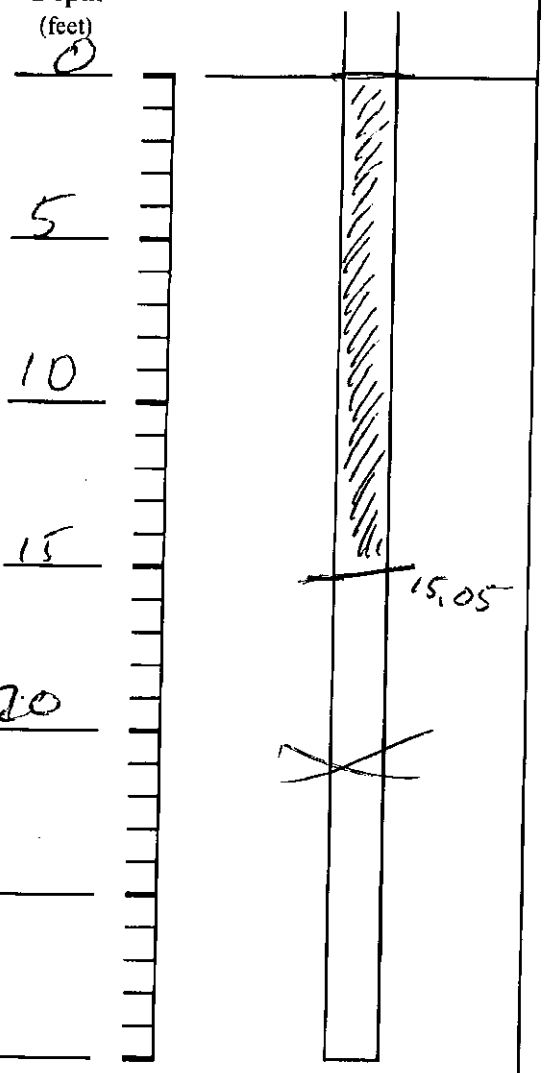
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: MW-1
Site Location: 68 Ferris St. Brooklyn	Driller:
Drilling Co.: Environ	Inspector: MW
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand Tools
Casing retrieved (feet)	-
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-15.05
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	8 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis - Red Hook #3

SITE ID.: Red Hook #3
INSPECTOR: MM
DATE/TIME: 05/04/19/0718
WELL ID.: MW-2

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-2

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): manhole
PROTECTIVE CASING MATERIAL TYPE: metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 15.15
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 6.56
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.
Access good, Overhead Power lines adjacent to well location.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.
Concrete well pad in Asphalt.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.): —

REMARKS:

FIGURE 3

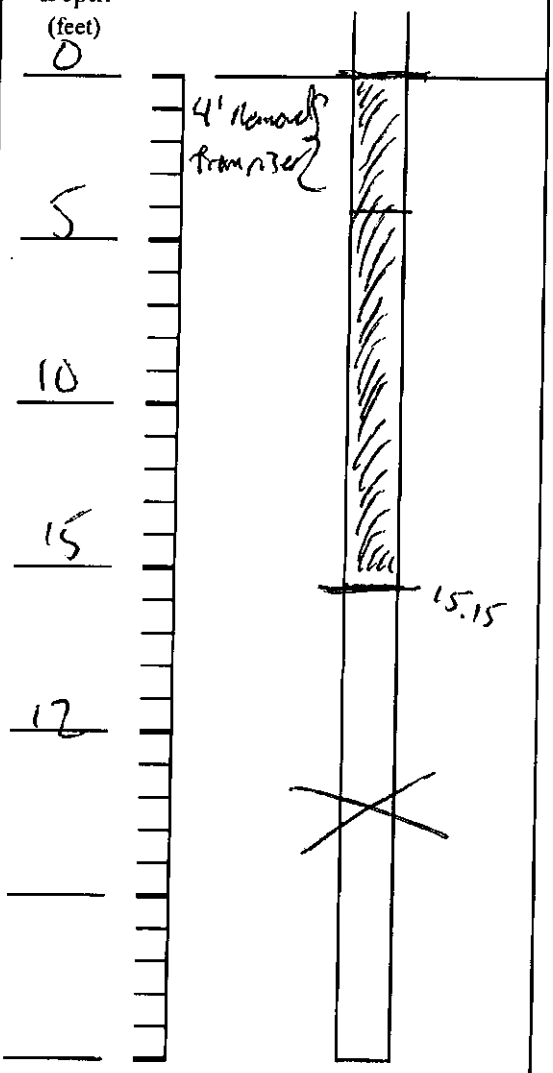
WELL DECOMMISSIONING RECORD

Site Name: Hercules - Red Hook #3	Well I.D.: MW-2
Site Location: 68 Ferris St. Brooklyn, NY	Driller:
Drilling Co.: Environbrae	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand tools
Casing retrieved (feet)	4'
Casing type/dia. (in)	2" PVC
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0 - 15.15
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	8 gal

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis-Redhook #3

SITE ID.: Redhook #3
INSPECTOR: MM
DATE/TIME: 05/08/14/0132
WELL ID.: MW-3

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: MW-3

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED: —
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable): Manhole
PROTECTIVE CASING MATERIAL TYPE: Metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches): 8"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		—
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet): 13.25
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet): 4.02
MEASURE WELL DIAMETER (Inches): 2"
WELL CASING MATERIAL: PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING: Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE: —
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES: —

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Good. Inside security gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Asphalt.

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT (e.g. Gas station, salt pile, etc.):

—

REMARKS:

✓

FIGURE 3

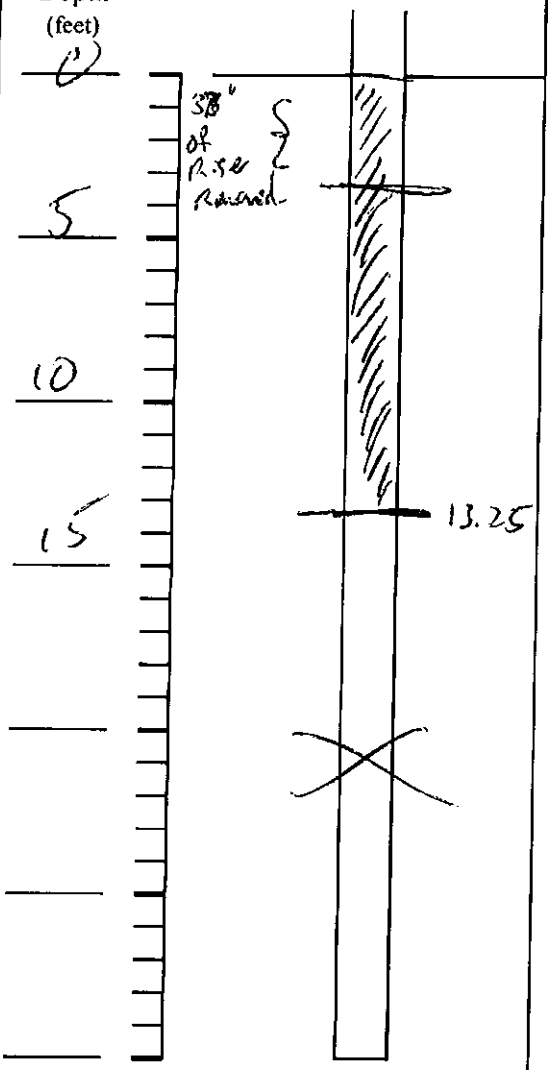
WELL DECOMMISSIONING RECORD

Site Name: Arcadis - Red Hook #3	Well I.D.: MW-3
Site Location: 68 Ferris St. Brooklyn, NY.	Driller:
Drilling Co.: Environtac	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING	
Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	
CASING PULLING	
Method employed	Hand Tools
Casing retrieved (feet)	~~5'~~
Casing type/dia. (in)	PVC/2"
CASING PERFORATING	
Equipment used	
Number of perforations/foot	
Size of perforations	
Interval perforated	
GROUTING	
Interval grouted (FBLS)	0-13.25
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	8 gal

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

Dan Raffaini
Drilling Contractor

Department Representative

FIGURE 1

SITE NAME: Arcadis Red Hook #3

SITE ID.: Red Hook #3

INSPECTOR: Amy

DATE/TIME: 05/08/14 / 1030

WELL ID.: TMW-1

MONITORING WELL FIELD INSPECTION LOG
NYSDEC WELL DECOMMISSIONING PROGRAM

	YES	NO
WELL VISIBLE? (If not, provide directions below)	✓	
WELL I.D. VISIBLE?	✓	
WELL LOCATION MATCH SITE MAP? (if not, sketch actual location on back)	✓	

WELL I.D. AS IT APPEARS ON PROTECTIVE CASING OR WELL: TMW-1

	YES	NO
SURFACE SEAL PRESENT?	✓	
SURFACE SEAL COMPETENT? (If cracked, heaved etc., describe below)	✓	
PROTECTIVE CASING IN GOOD CONDITION? (If damaged, describe below)	✓	

HEADSPACE READING (ppm) AND INSTRUMENT USED	—
TYPE OF PROTECTIVE CASING AND HEIGHT OF STICKUP IN FEET (If applicable)	Manhole
PROTECTIVE CASING MATERIAL TYPE:	metal
MEASURE PROTECTIVE CASING INSIDE DIAMETER (Inches):	5"

	YES	NO
LOCK PRESENT?		✓
LOCK FUNCTIONAL?		—
DID YOU REPLACE THE LOCK?		—
IS THERE EVIDENCE THAT THE WELL IS DOUBLE CASED? (If yes,describe below)		✓
WELL MEASURING POINT VISIBLE?	✓	

MEASURE WELL DEPTH FROM MEASURING POINT (Feet):	19.32
MEASURE DEPTH TO WATER FROM MEASURING POINT (Feet):	9.34
MEASURE WELL DIAMETER (Inches):	2"
WELL CASING MATERIAL:	PVC
PHYSICAL CONDITION OF VISIBLE WELL CASING:	Good
ATTACH ID MARKER (if well ID is confirmed) and IDENTIFY MARKER TYPE	—
PROXIMITY TO UNDERGROUND OR OVERHEAD UTILITIES	—

DESCRIBE ACCESS TO WELL: (Include accessibility to truck mounted rig, natural obstructions, overhead power lines, proximity to permanent structures, etc.); ADD SKETCH OF LOCATION ON BACK, IF NECESSARY.

Access Good, behind Sewer by gate.

DESCRIBE WELL SETTING (For example, located in a field, in a playground, on pavement, in a garden, etc.) AND ASSESS THE TYPE OF RESTORATION REQUIRED.

Concrete

IDENTIFY ANY NEARBY POTENTIAL SOURCES OF CONTAMINATION, IF PRESENT
(e.g. Gas station, salt pile, etc.):

—

REMARKS:

✓

FIGURE 3

WELL DECOMMISSIONING RECORD

Site Name: Arnold's Bellhook #3	Well I.D.: TMW-1
Site Location: 668 Fourth St. Brooklyn, NY	Driller:
Drilling Co.: Env. Well	Inspector: MM
	Date: 05/06/19

DECOMMISSIONING DATA
(Fill in all that apply)

OVERDRILLING

Interval Drilled	
Drilling Method(s)	
Borehole Dia. (in.)	
Temporary Casing Installed? (y/n)	
Depth temporary casing installed	
Casing type/dia. (in.)	
Method of installing	

CASING PULLING

Method employed	Hand tools
Casing retrieved (feet)	2'
Casing type/dia. (in)	PVC/2"

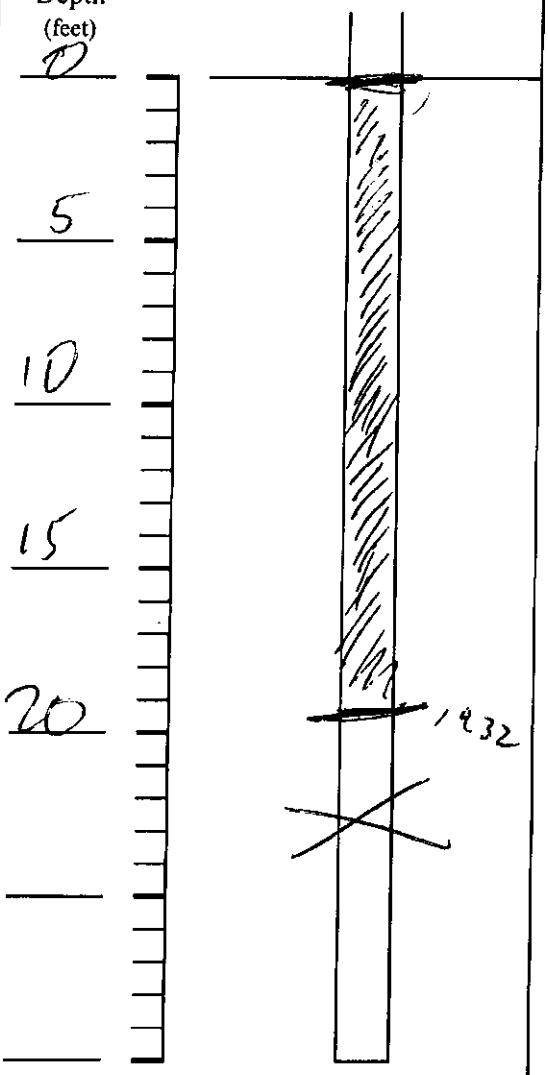
CASING PERFORATING

Equipment used	-
Number of perforations/foot	
Size of perforations	
Interval perforated	

GROUTING

Interval grouted (FBLS)	0-19.2'
# of batches prepared	1
For each batch record:	
Quantity of water used (gal.)	40
Quantity of cement used (lbs.)	250
Cement type	Portland
Quantity of bentonite used (lbs.)	10-15
Quantity of calcium chloride used (lbs.)	-
Volume of grout prepared (gal.)	45
Volume of grout used (gal.)	11 gal.

WELL SCHEMATIC*



COMMENTS:

* Sketch in all relevant decommissioning data, including: interval overdrilled, interval grouted, casing left in hole, well stickup, etc.

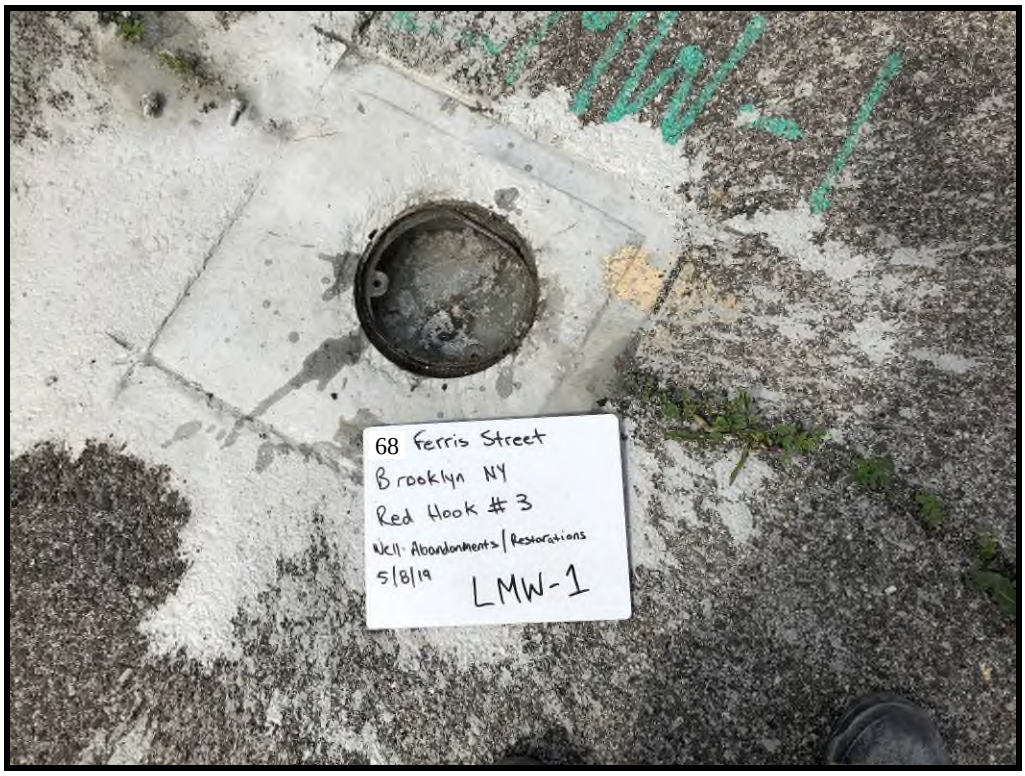
Drilling Contractor

Department Representative

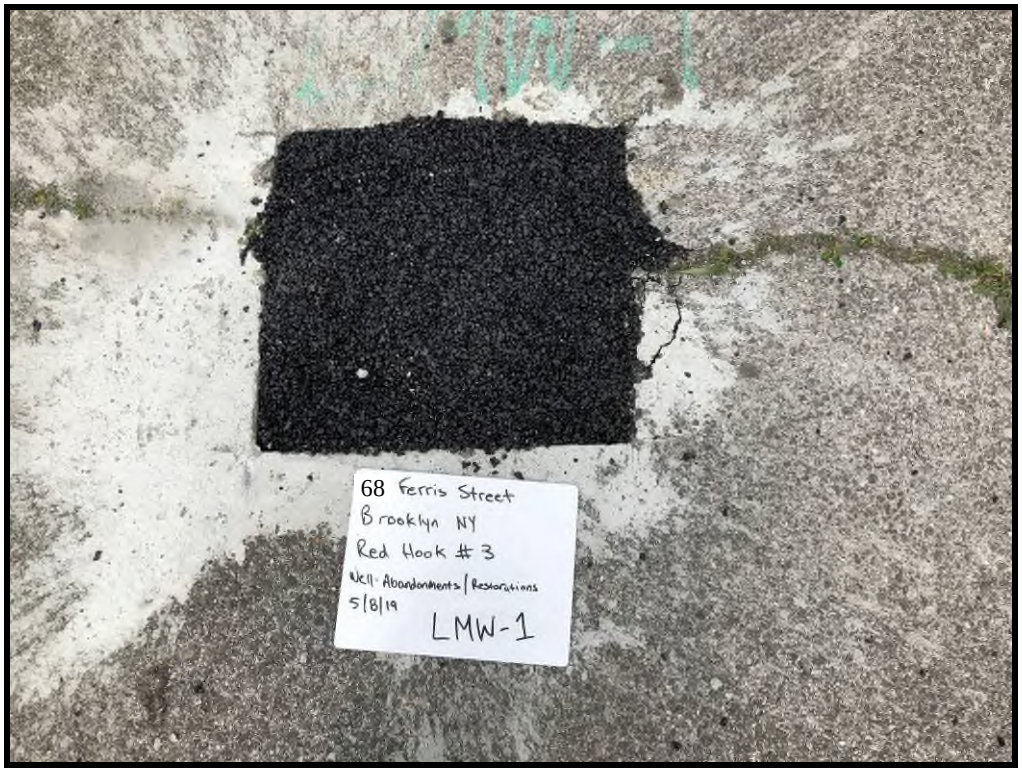
ATTACHMENT 2

Photolog

BT Red Hook, LLC - Red Hook 3 Well Decommissioning
68 and 100 Ferris Street/242 and 300 Coffey Street, Brooklyn, NY



LMW-1 with PVC Riser Grouted



LMW-1 Surface Completion

LMW-2 with PVC Riser Grouted

LMW-2 Surface Completion

LMW-3 with PVC Riser Grouted

LMW-3 Surface Completion with Cold-Patch

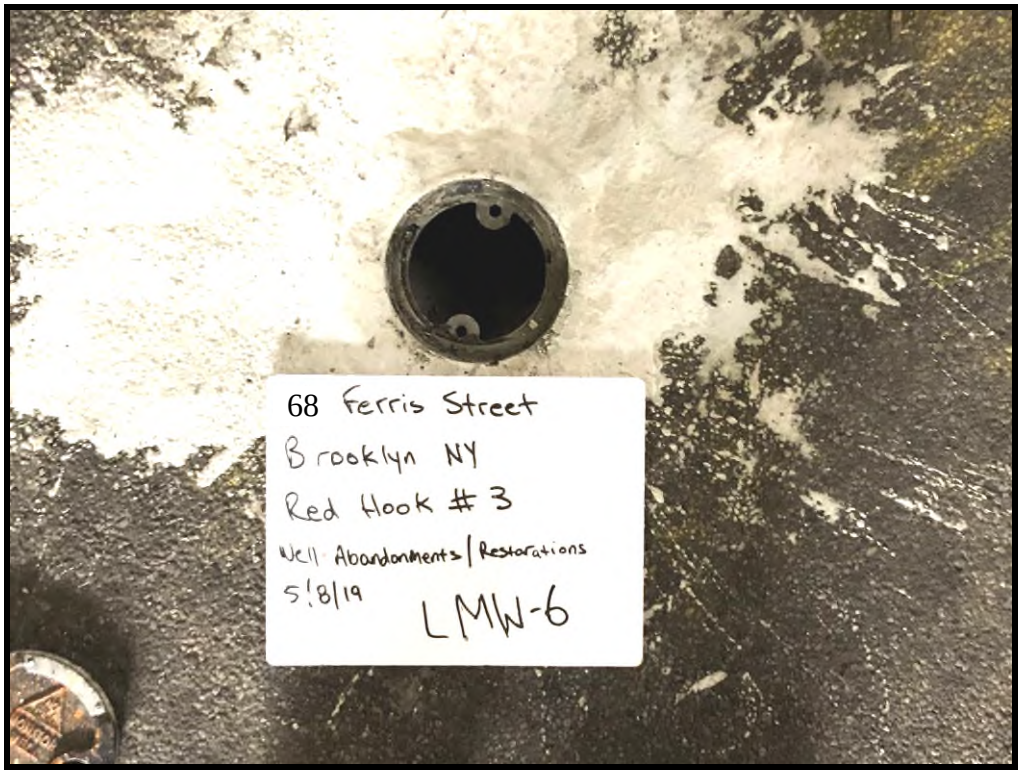
LMW-4 PVC Screen and Riser in Process of Grouting (Typical)

LMW-4 with PVC Riser Grouted

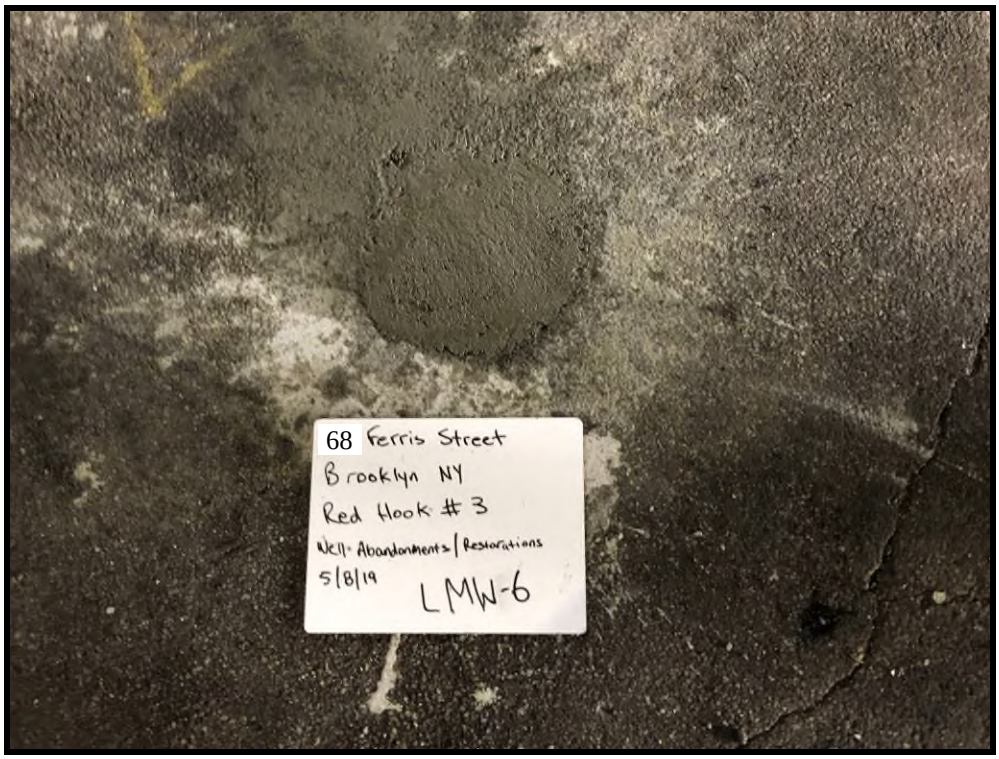
LMW-4 Surface Completion with Cold-Patch

LMW-5 with PVC Riser Grouted

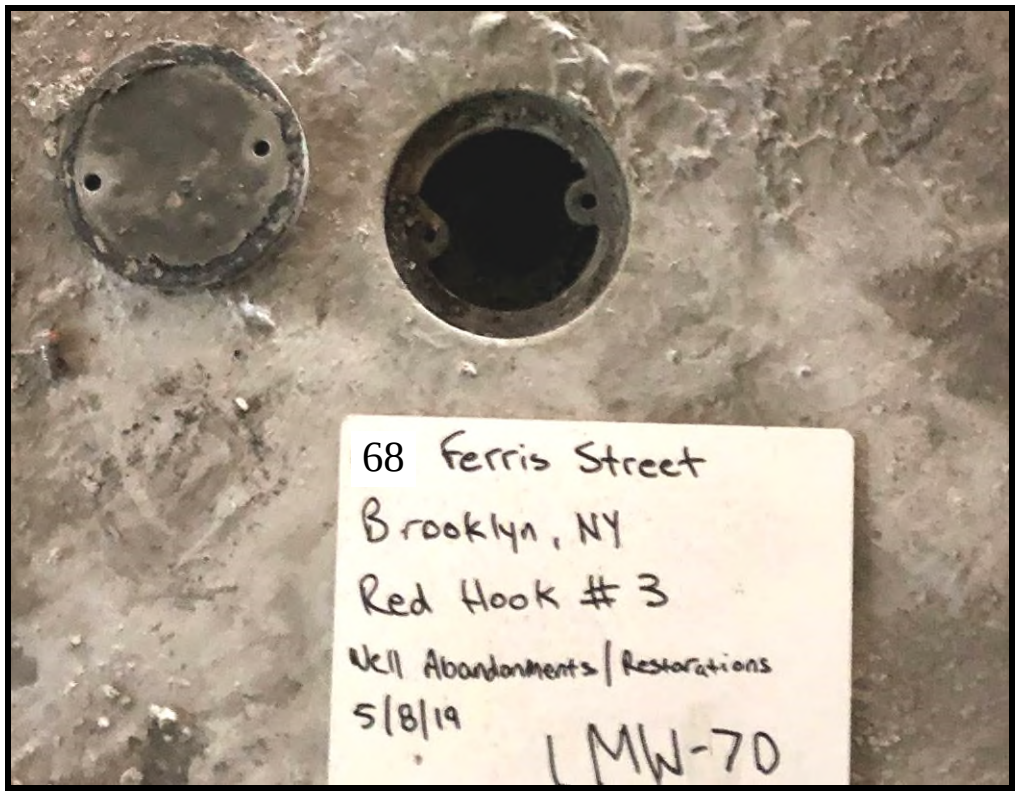
LMW-5 Surface Completion with Cold-Patch



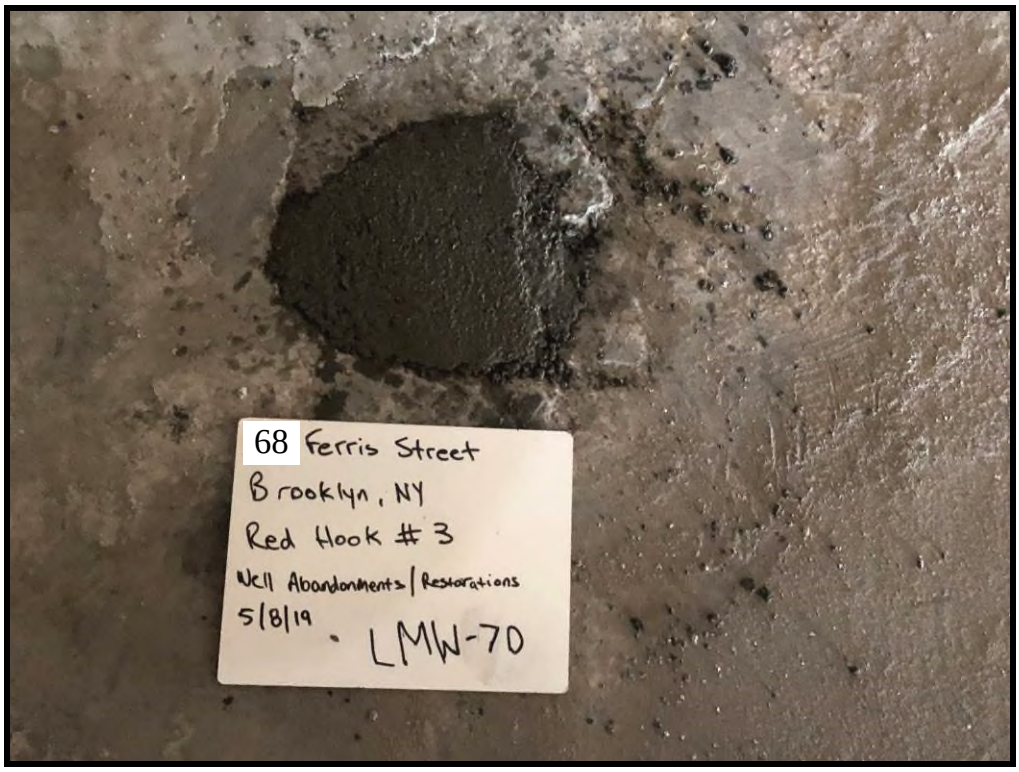
LMW-6 (Inside Brick Warehouse) with PVC Riser Grouted



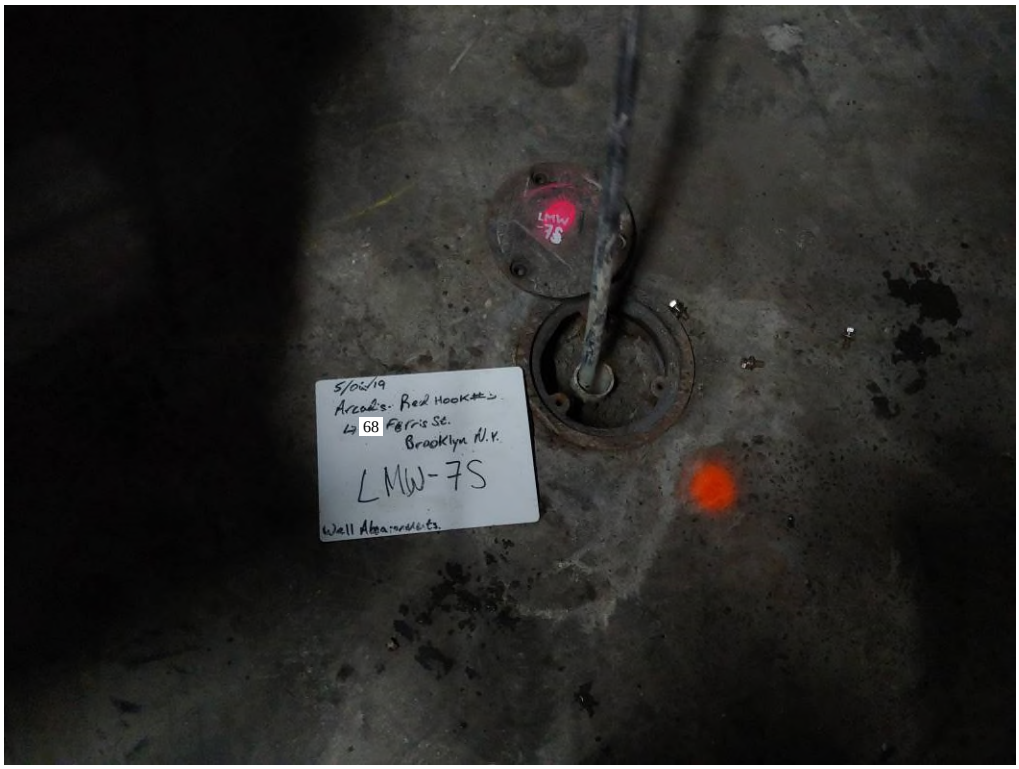
LMW-6 Surface Completion with Cement



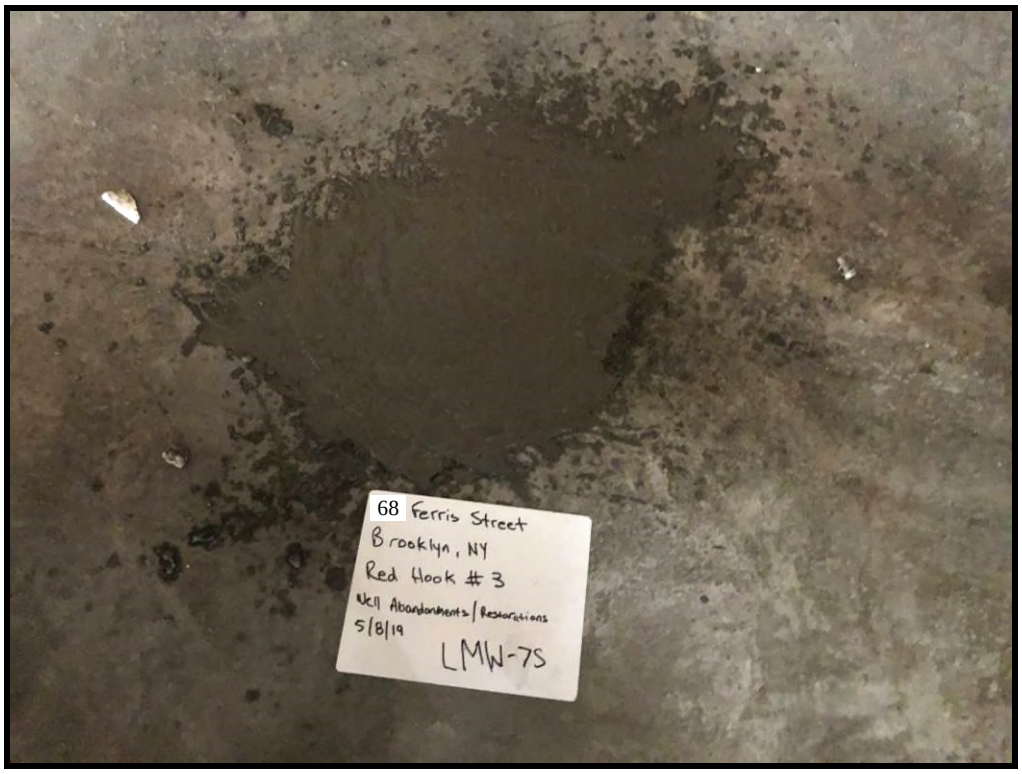
LMW-7D (Inside Blue Warehouse) with PVC Riser Grouted



LMW-7D Surface Completion with Cement

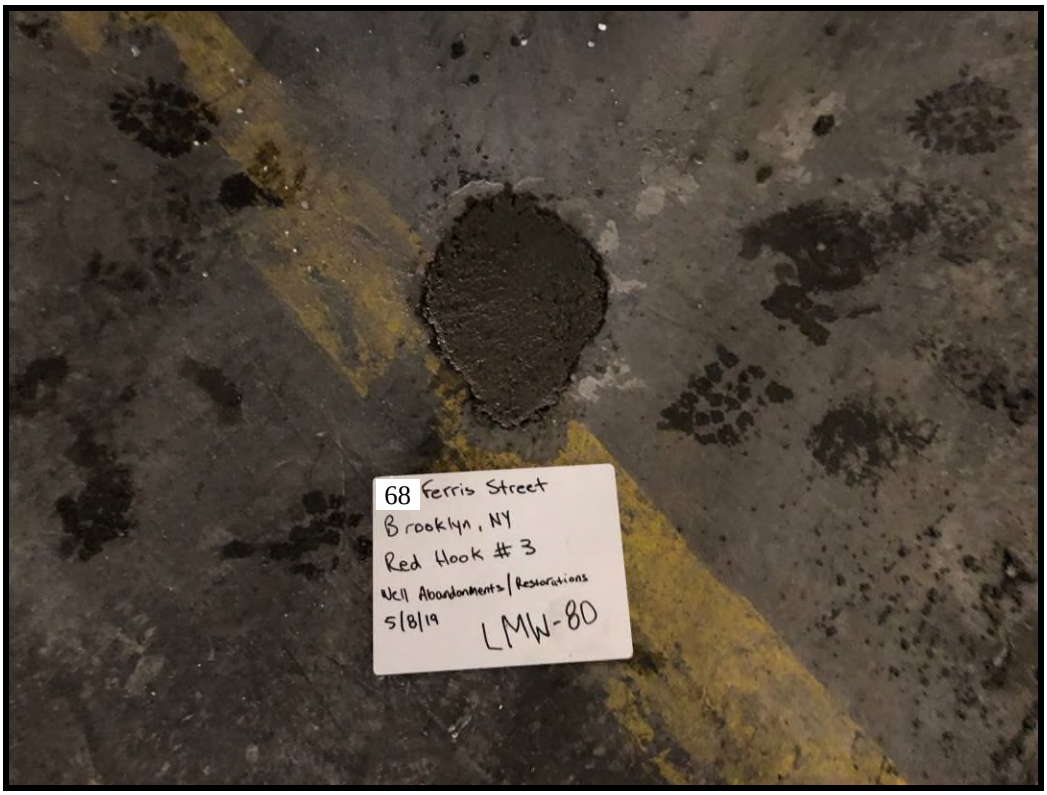


LMW-7S (Inside Blue Warehouse) PVC Screen and Riser in Process of Grouting



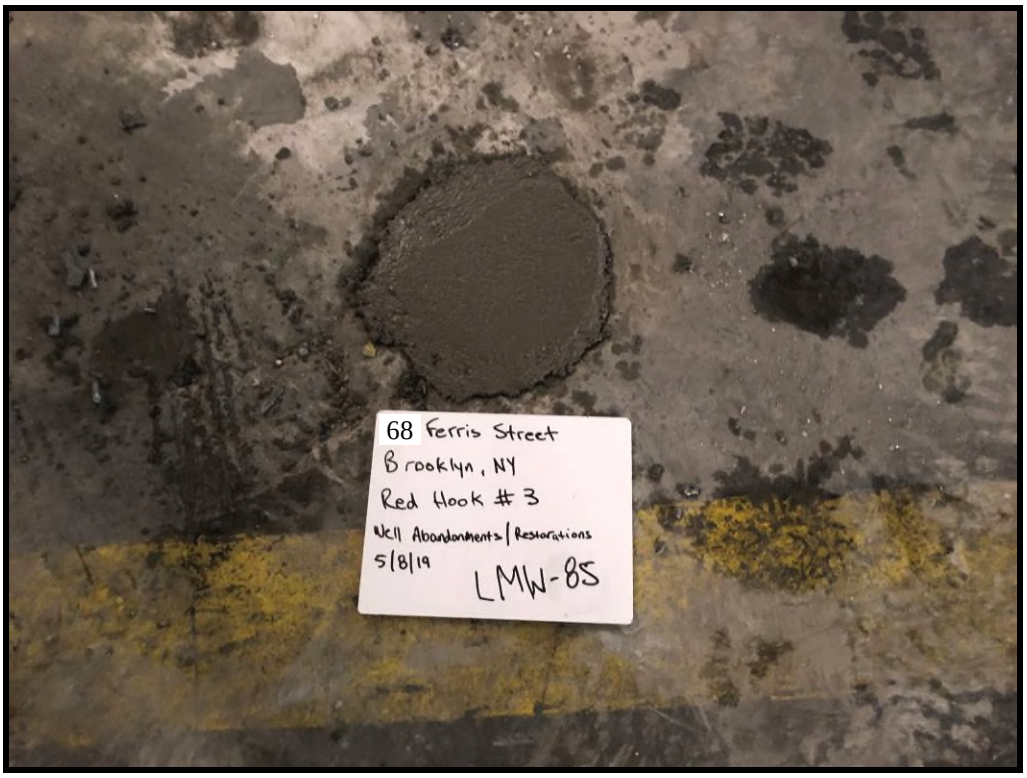
LMW-7S Surface Completion with Cement

LMW-8D (Inside Blue Warehouse) with Grouting in Progress



LMW-8D Surface Completion with Cement

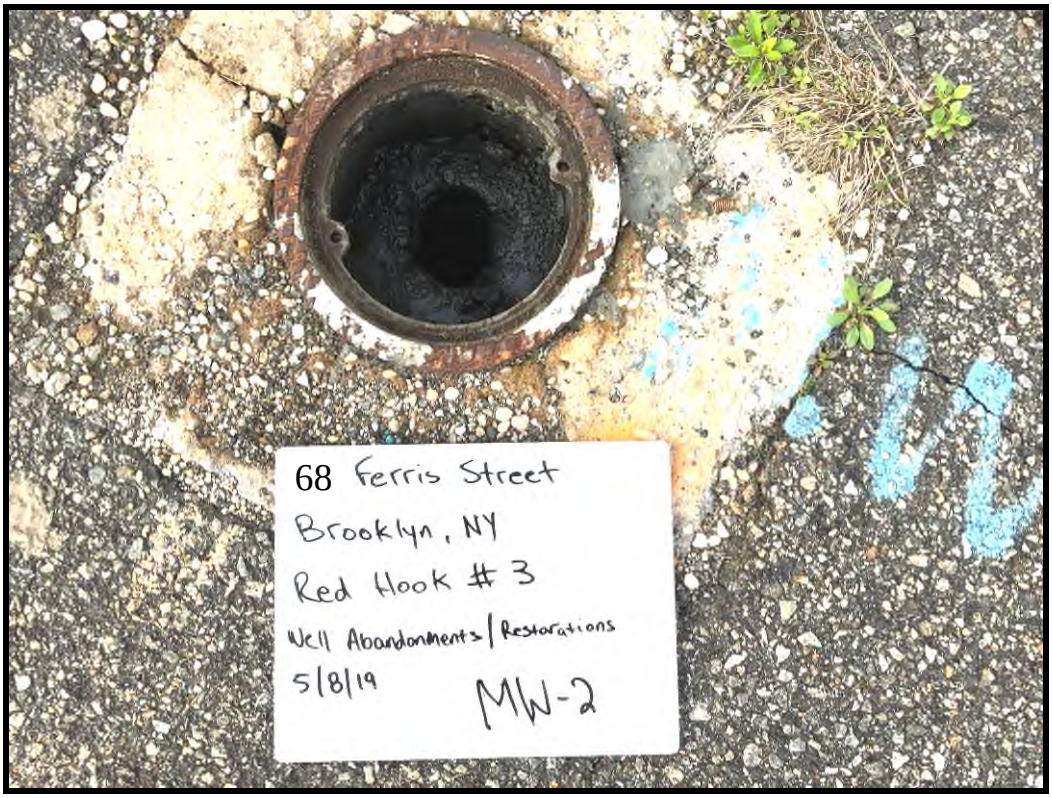
LMW-8S (Inside Blue Warehouse) with PVC Riser Grouted



LMW-8S Surface Completion with Cement

MW-1 with PVC Riser Grouted

MW-1 Surface Completion with Cold Patch



MW-2 with PVC Riser Grouted

MW-2 Surface Completion with Cold Patch

MW-3 with PVC Riser Grouted

MW-3 Surface Completion with Cold Patch

MW-9D with PVC Riser Grouted

MW-9D Surface Completion with Cold Patch

MW-9S with PVC Riser Grouted

MW-9S Surface Completion with Cold Patch

MW-10D with PVC Riser Grouted

MW-10D Surface Completion with Cold Patch

MW-10S with PVC Screen and Riser in Process of Grouting

MW-10S Surface Completion with Cold Patch

MW-11D with PVC Screen and Riser in Process of Grouting

MW-11D Surface Completion with Cold Patch

MW-11S with PVC Riser Grouted

MW-11S Surface Completion with Cold Patch

MW-12D with PVC Screen and Riser in Process of Grouting

MW-12D Surface Completion with Cold Patch

MW-12S with PVC Riser Grouted

MW-12S Surface Completion with Cold Patch

TMW-1 with PVC Riser Grouted

TMW-1 Surface Completion with Cold Patch

ARCADIS Design & Consultancy for natural and built assets

Mr. Chris Heller
Project Manager – Remediation Bureau A
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, NY 12233-7015

Arcadis of New York, Inc.
One Lincoln Center
110 West Fayette Street
Suite 300
Syracuse
New York 13202
Tel 315 446 9120
Fax 315 449 0017
www.arcadis.com

Environment

Subject:
Red Hook 3 – Revised Draft Interim Remedial Measure Design Work Plan
NYSDEC Brownfield Site #C224213
68 and 100 Ferris Street/242 and 300 Coffey Street
Brooklyn, Kings County, New York 11231

Date:
October 10, 2019

Contact:
Terry Young, PE

Phone:
315.671.9478

Email:
Terry.young2@arcadis.com

Our ref:
30034367.01

Dear Chris:

This letter has been prepared in response to the New York State Department of Environmental Conservation's (NYSDEC's) comments on the July 9, 2019 revised Draft Interim Remedial Measure (IRM) Design Work Plan (DWP) for the above-referenced site, which were provided in an August 27, 2019 letter. Based on the NYSDEC's comments, the results of a September 9, 2019 meeting with NYSDEC in Albany to discuss a proposed, revised remedy, and communications subsequent to the meeting, Arcadis has attached a revised Draft IRM DWP. Provided below is background information, followed by responses to specific items offered in NYSDEC's comment letter and details regarding the proposed, revised Red Hook 3 (RH3) IRM.

Background:

As the NYSDEC is aware, the previously proposed excavation IRM for the RH3 Site (July 9, 2019 revised Draft IRM DWP) was the culmination of more than 7 years of investigation activities, which included:

- Installing and sampling 22 monitoring wells, including 6 well pairs in and around the location of the former Metal Warehouse, where the proposed excavation areas are located
- Drilling/characterizing 114 soil borings prior to and during the Supplemental Remedial Investigation (SRI) completed in 2018 and documented in the SRI Report approved by NYSDEC in a letter dated April 5, 2019
- Drilling 75 soil borings post-SRI to confirm dense non-aqueous phase liquid (DNAPL) extent and obtain waste characterization data required for off-site treatment/disposal purposes

The results of this extensive investigation revealed:

- Delineated, identifiable potential source areas
- Recoverable DNAPL did not accumulate in any of 22 RH3 groundwater monitoring wells
- Groundwater concentrations diminish rapidly with distance from borings with observed DNAPL
- RH3 has downward hydraulic gradient
- A defined horizontal or vertical conduit or pathway from RH3 and Wolcott Street to RH4 was not identified for DNAPL impacts
- RH3 DNAPL and the RH4 DNAPL have a similar chemical composition but are different in appearance and have subtle differences in the distributions of biomarkers, suggesting that the RH3 DNAPL is different than the RH4 DNAPL
- No complete exposure pathways exist, except for future construction and/or utility workers

These findings along with communications with the NYSDEC were used to offer a technically sound proposed remedy in the July 9, 2019 Draft IRM DWP that supports commercial redevelopment of the property. Specifically, the proposed remedy was an aggressive Brownfield Cleanup Program (BCP) Track 4 remedy that would remove approximately 6,000 cubic yards (CY) of source material as an IRM, and be combined with institutional controls and an engineering control in the form of a ground surface cover to provide a comprehensive site remedy. It should be noted that the July 9, 2019 Draft IRM DWP submission included revisions to the prior (June 3, 2019) IRM DWP submittal in order to:

1) Address NYSDEC comments (letter dated May 24, 2019);

2) Provide results of the pre-design confirmation soil boring program, as discussed during the July 2, 2019 conference call among representatives from NYSDEC, New York State Department of Health (NYSDOH), and Arcadis; and

3) Address modifications identified in NYSDEC's July 3, 2019 email as needed before the Draft IRM DWP can be placed in the repository for public comments. In an effort to facilitate timely completion of the required modifications and placement of the Draft IRM DWP in the public repository, Arcadis provided a follow-up email to NYSDEC on July 5, 2019 to identify the specific text edits to be made in the revised submittal that was submitted on July 9, 2019.

Proposed IRM revisions offered in this letter and the attached Draft IRM DWP represent the fourth round of revisions and are based on the NYSDEC's August 27, 2019 comment letter and the meeting held with NYSDEC on September 9, 2019 to discuss the revised remedy described in the attached IRM DWP.

<u>Responses to NYSDEC's August 27, 2019 Comment Letter</u>:

NYSDEC's comment letter identifies 12 locations that would remain "un-remediated" based on the excavation limits in the July 9, 2019 Draft IRM DWP and specifies that these locations "*will require long term monitoring and possible additional remedial action (in addition to institutional controls*)". Each of these locations is deeper than 15 feet below ground surface, which is the depth used to determine the appropriate land use category for a site (6NYCRR Part 375-1.8(g)(6)(iii)). Although NYSDEC's assertion in the letter that these locations are a "*constant source of groundwater contamination*" is not supported by the findings of the extensive investigation activities completed under the NYSDEC's direction, a more aggressive RH3 IRM has been developed. As discussed with NYSDEC, the more aggressive RH3 IRM was developed to achieve the following: 1) address NYSDEC comments; 2) facilitate timely approval to

support initiation of the public comment period in October 2019, while avoiding project delays; and 3) meet BT Red Hook, LLC's redevelopment schedule which includes completing the ongoing RH4 Excavation IRM (substantial completion estimated for December 2019) and then initiating the RH3 IRM beginning in January 2020. The more aggressive RH3 IRM was discussed during the September 9, 2019 meeting, is summarized below and detailed in the attached IRM DWP.

Proposed Revised RH3 IRM:

Based on the NYSDEC's August 27, 2019 comment letter, the September 9, 2019 meeting and communications subsequent to the meeting, we have updated the IRM RDWP to provide modifications to the remedy that address the NYSDEC's comments. As discussed during our September 9, 2019 meeting, we propose to address NAPL locations identified in NYSDEC's comment letter through removal, as well as in-place treatment.

The proposed RH3 IRM consists of the following:

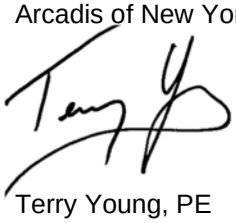
- Excavate an additional estimated 1,000 CY to address 8 of the 12 potential source locations identified in NYSDEC's letter (total estimated RH3 excavation volume is 7,000 CY)
- In-place treatment through Engineered Anaerobic Biological Oxidation (ABOx), which consists of subsurface emplacement of gypsum (calcium sulfate dihydrate [$CaSO_4*2H_2O$]) to provide a long-term source of sulfate to facilitate the ongoing degradation of petroleum tar-related impacts at the RH3 Site. Each of the IRM excavation areas will be backfilled to grade with off-site general fill that complies with the Remedial Design (including NYSDEC DER-10), and gypsum will be mixed within the backfill placed within the saturated zone. Backfill will be amended with gypsum at a concentration of up to 5% by dry weight from the bottom of each excavation to approximately 5 feet bgs (i.e., saturated zone, incorporating the approximate seasonal high water table). The general fill and gypsum will be thoroughly blended to create a homogenous mixture within the specified depth interval prior to achieving appropriate compaction. The balance of each excavation area will be backfilled with the general fill.

This remedial approach is consistent with that recently completed at another site located in Brooklyn with similar site impacts and redevelopment plans (Former Dangman Park MGP Site, No. 224047).

We appreciate NYSDEC's attention to this project and support for advancing the RH3 IRM in January 2020. Please do not hesitate to contact me should you have any questions or require additional information.

Sincerely,

Arcadis of New York, Inc.



Terry Young, PE
Vice President of Engineering

Copies:
George Heitzman, PE, NYSDEC
Rob DeCandia, PE, NYSDEC
Eric Obrecht, NYSDEC
Justin Deming, NYSDOH
Wendy Kuehner, PE NYSDOH
Moniqua Williams, BT Red Hook, LLC
Hugh Devery, Arcadis
Cathy Geraci, Arcadis

Enclosures:

Attachments

1 Revised Draft IRM DWP

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau A
625 Broadway, 12th Floor, Albany, NY 12233-7015
P: (518) 402-9625 I F: (518) 402-9627
www.dec.ny.gov

November 26, 2019

Mr. Terry Young
ARCADIS of New York
One Lincoln Center, Suite 300
110 West Fayette Street
Syracuse, New York 13202

Re: Red Hook 3 Revised IRM Work Plan Comments
Red Hook 3 – NYSDEC Brownfield Site #C224213
68 and 100 Ferris Street, 242 and 300 Coffey St.
Brooklyn, Kings County, New York 11231

Dear Mr. Young

The New York State Department of Environmental Conservation (the Department) and the New York State Department of Health (NYSDOH) have reviewed the IRM Draft Work Plan for the Red Hook 3 Properties site, dated March 2019, which was prepared by ARCADIS of New York on behalf of BT Red Hook LLC. Please revise the report per the following comments and submit for review and public comment.

- In section 4 include the Tidal wetlands permit to the list of IRM permits.
- Figure 5 shows the locations where NAPL was identified during confirmation sampling. Only the locations inside the previously proposed excavation limits follow the legend showing NAPL shallower and deeper than 15 feet. Please modify the figure to follow the legend for all boring locations where NAPL was identified.

If you have any questions, feel free to contact me at 518-402-0163 or at chris.heller@dec.ny.gov.

Sincerely,

Chris Heller
Project manager
Remedial Bureau A
Division of Environmental Remediation

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Environmental Remediation, Remedial Bureau A
625 Broadway, 12th Floor, Albany, NY 12233-7015
P: (518) 402-9625 I F: (518) 402-9627
www.dec.ny.gov

Ecc: H. Devery, ARCADIS
C. Geraci, ARCADIS
R. DeCandia, NYSDEC
J. O'Connell, NYSDEC Region 2
S. McLaughlin / W. Kuehner, NYSDOH

Arcadis of New York, Inc.

One Lincoln Center

110 West Fayette Street

Suite 300

Syracuse, New York 13202

Tel 315 446 9120

Fax 315 449 0017

www.arcadis.com