34 BERRY STREET
KINGS COUNTY
BROOKLYN, NEW YORK

SITE MANAGEMENT PLAN

NYSDEC Site Number: C224268

AKRF Project Number: 11259

Prepared for:

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Revisions to Final Approved Site Management Plan:

Revision No.	Date Submitted	Summary of Revision	NYSDEC Approval Date
1	12/04/2024	Reduction in groundwater sampling program	02/24/2025
2	07/17/2026	Reduction in groundwater sampling program and Transfer of COC	09/04/2026

SEPTEMBER 2026

CERTIFICATION STATEMENT

I, Rebecca Kinal, P.E., certify that I am currently a NYS registered professional engineer as defined in 6 NYCRR Part 375 and that this Site Management Plan 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).



REBECCA KINAL, P.E.	09/15/2026	
NYS Professional Engineer #082046-1	Date	Signature

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LIST OF ACRONYMS

Acronym	Definition
1,2-DCA	1,2-Dichloroethane
1,2-DCP	1,2-Dichloropropane
AGV	Air Guidance Value
AWQSGV	Ambient Water Quality Standards and Guidance Values
AWQS	Ambient Water Quality Standards
bbg	Below Basement Grade
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CAMP	Community Air Monitoring Plan
CMWP	Corrective Measures Work Plan
CFM	Cubic Feet per Minute
CFR	Code of Federal Regulations
CHASP	Construction Health and Safety Plan
CMWP	Corrective Measures Work Plan
COC	Certificate of Completion
CUSCO	Commercial Use Soil Cleanup Objectives
DD	Decision Document
DER	Division of Environmental Remediation
DO	Dissolved Oxygen
DUSR	Data Usability Summary Report
EC	Engineering Control
ECL	Environmental Conservation Law
EE	Environmental Easement
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
EWP	Excavation Work Plan
FER	Final Engineering Report
GAC	Granular Activated Carbon
GPM	Gallons per Minute
HASP	Health and Safety Plan
IC	Institutional Control
IDW	Investigation-Derived Waste
ISDD	In-Situ Design Document
IW	Injection Well
LNAPL	Light Non-Aqueous Phase Liquid
MBAS	Methyl Blue Active Substances
mg/kg	Milligrams per Kilogram
mg/L	Milligram per Liter

Acronym	Definition
MGP	Manufactured Gas Plant
MNA	Monitored Natural Attenuation
NAPL	Non-Aqueous Phase Liquid
NNO	Notice of No Objection
NOS	Notice of Satisfaction
NY	New York
NYC	New York City
NYCRR	New York Codes, Rules and Regulations
NYCDEP	New York City Department of Environmental Protection
NYCDOB	New York City Department of Buildings
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
NYSDOT	New York State Department of Transportation
NYCDOHMH	New York City Department of Health and Mental Hygiene
OER	New York City Office of Environmental Remediation
O&M	Operations and Maintenance
OM&M	Operations, Monitoring, and Maintenance
OSHA	United States Occupational Safety and Health Administration
OWS	Oil/Water Separator
P.E.	Professional Engineer
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethylene
PDI	Pre-Design Investigation
PDIWP	Pre-Design Investigation Work Plan
PG	Professional Geologist
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PID	Photoionization Detector
PLC	Programmable Logic Controller
ppb	Parts per Billion
PPE	Personal Protective Equipment
ppm	Parts per Million
PRR	Periodic Review Report
psi	Pound-Force per Square Inch
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QEP	Qualified Environmental Professional
RA	Remedial Action

Acronym	Definition
RAO	Remedial Action Objective
RAP	Remedial Action Plan
RAWP	Remedial Action Work Plan
RCA	Recycled Concrete Aggregate
RD	Remedial Design
REC	Recognized Environmental Condition
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
RP	Remedial Party
RRSCO	Restricted Residential Soil Cleanup Objective
RSO	Remedial Site Optimization
RW	Recovery/Extraction Well
SCG	Standard, Criteria, And Guidance
SCO	Soil Cleanup Objective
SIM	Selected Ion Monitoring
SM	Site Management
SMP	Site Management Plan
SPDES	State Pollutant Discharge Elimination System
SPLP	Synthetic Precipitation Leaching Procedure
SRI	Supplemental Remediation Investigation
SRIWP	Supplemental Remedial Investigation Work Plan
SSDS	Sub-Slab Depressurization System
SSSCO	Site-Specific Soil Cleanup Objective
SVI	Soil Vapor Intrusion
SVOC	Semivolatile Organic Compound
TAL	Target Analyte List
TCE	Trichloroethylene
TCL	Target Compound List
TOGS	Technical Operational and Guidance Series
TPH	Total Petroleum Hydrocarbons
UST	Underground Storage Tank
UUSCO	Unrestricted Use Soil Cleanup Objective
VOC	Volatile Organic Compound
µg/L	Micrograms per Liter
$\mu g/m^3$	Micrograms per Cubic Meter

EXECUTIVE SUMMARY

The following provides a brief summary of the controls implemented for the Site, as well as the inspections, monitoring, maintenance and reporting activities required by this Site Management Plan:

In-Text Table 1
Site Management Plan Summary

Site Identification:	Site No. C224268 34 Berry Street Brooklyn, New York
Institutional Controls:	1. The property may be used for restricted residential use as set forth in the Environmental Easement.
	2. All Engineering Controls (ECs) must be operated and maintained as specified in the SMP.
	3. All ECs must be inspected at a frequency and in a manner defined in the SMP.
	4. The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or the New York City Department of Health and Mental Hygiene (NYCDOHMH) to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department.
	5. Groundwater and other environmental or public health monitoring must be performed as defined in this SMP.
	6. Data and information pertinent to Site management must be reported at the frequency and in a manner as defined in this SMP.
	7. All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP.
	8. Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP.
	9. Operation, maintenance, monitoring, inspection, and reporting of the mechanical or physical components of the remedy shall be performed as defined in the SMP.
	10. Access to the Site must be provided to agents, employees, or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified in the Environmental Easement.
	11. The potential for vapor intrusion must be evaluated for any new buildings developed in the area within the IC boundaries and any potential impacts that are identified must be monitored or mitigated.
	12. Vegetable gardens and farming on the Site are prohibited.
Engineering Controls:	1. Site Cover System.
	2. Groundwater Treatment System
Inspections: 1. Site Cover System Inspection 2. Groundwater Treatment System	Annually Monthly

Site Identification:	Site No. C224268 34 Berry Street Brooklyn, New York
Monitoring:	
1. Groundwater Treatment System	As Needed
2. Groundwater Monitoring Wells	Quarterly
3. Periodic Review Report	Annually
Maintenance:	
1. Site Cover System	As Needed
2. Groundwater Treatment System	Quarterly/As Needed
Reporting:	
1. Groundwater Treatment System Operation & Maintenance (O&M) Report	Quarterly
2. Periodic Review Report	Annually

Further descriptions of these requirements are provided in detail in the latter sections of this Site Management Plan.

1.0 INTRODUCTION

This Site Management Plan (SMP) is a required element of the remedial program for the 34 Berry Street Site located in Brooklyn, New York (hereinafter referred to as the "Site"), also identified as Tax Block 2289, Lot 14 on the New York City Tax Map. The Site is currently enrolled in the New York State (NYS) Brownfield Cleanup Program (BCP) (Site No. C224268) as a "Volunteer", which is administered by the New York State Department of Environmental Conservation (NYSDEC). The Site was investigated and remediated in accordance with Brownfield Cleanup Agreement (BCA) Index No. C224268-01-18, executed in March 2018 by 34 Berry Street LLC (the Volunteer). The Site was remediated to a Track 4 Site Specific Soil Cleanup Objectives in accordance with the NYSDEC-approved Remedial Action Work Plan (RAWP), Final Engineering Report (FER), and Decision Document (DD), as described in this SMP. A Certificate of Completion (COC) for the remediation was issued by NYSDEC on December 2, 2022. In March 2026 the Volunteer transferred title to DS 34 Berry LLC, DS 34 Berry II LLC, and DS 34 Berry III LLC c/o Delshah Management and a Notice of Transfer of Certificate of Completion describing transfer of title and transfer of the COC was recorded on March 31, 2026.

1.1 General

The Volunteer entered into a BCA to investigate and remediate the approximately 0.825-acre Site. A Site Location Map is provided as Figure 1 and a Site Plan showing the Site boundaries is provided as Figure 2. The boundaries of the Site are more fully described in the metes and bounds site description that is part of the Environmental Easement (EE) provided in Appendix A.

1.2 Purpose

After completion of the remedial work described in the Remedial Action Work Plan (RAWP) and In-Situ Design Document (ISDD), some contamination was left at the Site, which is hereafter referred to as "remaining contamination." Institutional and Engineering Controls (ICs and ECs) have been incorporated into the Site remedy to control exposure to remaining contamination, thereby ensuring protection of public health and the environment. An EE will be granted to NYSDEC and recorded with the Office of the City Register of the City of New York and will require compliance with this SMP and all ECs and ICs placed on the Site.

This SMP was prepared to manage remaining contamination at the Site until the EE is extinguished in accordance with ECL Article 71, Title 36. This plan has been approved by NYSDEC, and compliance with this plan is required by the grantor of the EE and the grantor's successors and assigns. This SMP may be revised only with the approval of NYSDEC.

It is important to note that:

1. This SMP details the site-specific implementation procedures that are required by the EE. Failure to properly implement the SMP is a violation of the EE, which is grounds for revocation of the COC; and
2. Failure to comply with this SMP is also a violation of Environmental Conservation Law, 6 New York Codes, Rules, and Regulations (NYCRR) Part 375 and the BCA (Index No. C224268-01-18; Site No. C224268) for the Site, and thereby subject to applicable penalties.

All reports associated with the Site can be viewed by contacting NYSDEC or its successor agency managing environmental issues in New York State. A list of contacts for persons involved with the Site is provided in In-Text Tables 2 and 3 of this SMP.

This SMP was prepared by AKRF, Inc. (AKRF) on behalf of the Volunteer in accordance with the requirements of NYSDEC's DER-10 ("Technical Guidance for Site Investigation and Remediation"), dated May 2010, and the guidelines provided by NYSDEC. This SMP addresses the means for implementing the ICs and ECs that are required by the EE for the Site.

1.3 Revisions

The original SMP, approved by NYSDEC on October 20, 2022 was revised in November 2024 to reduce the number of monitoring wells sampled as part of the groundwater monitoring program described in Section 4.3.1. This change was proposed based on monitoring results described in the May 2024 Periodic Review Report, and was approved by NYSDEC in a letter dated September 9, 2024.

The November 2024 revised SMP, approved by NYSDEC on February 24, 2024 was updated in June 2026 to reduce the frequency in monitoring of select wells and discontinue SVOC analysis for all on-site monitoring wells. This change was proposed based on monitoring results described in the December 2025 Quarterly Monitoring Report, and was approved by NYSDEC in an email dated May 1, 2026. A copy of the NYSDEC email approval was included in the June 2026 Summary Report. Section 4.3.1 includes the updated list of monitoring wells that are currently sampled on a quarterly, semi-annual, and annual basis.

Any additional revisions to this SMP will be proposed in writing to NYSDEC's project manager. Revisions will be necessary upon, but not limited to, the following occurring: a change in media monitoring requirements, upgrades to or a shut-down of a remedial system, post-remedial removal of contaminated sediment or soil, or other significant change(s) to the Site conditions. In accordance with the EE for the Site, NYSDEC will provide a notice of any approved changes to the SMP, and append these notices to the SMP that is retained in its files.

1.4 Notifications

Notifications will be submitted by the property owner to NYSDEC, as needed, in accordance with NYSDEC's DER-10 for the following reasons:

- 60-day advanced notice of any proposed changes in Site use that are required under the terms of the BCA, 6NYCRR Part 375 and/or Environmental Conservation Law (ECL);
- 7-day advanced notice of any field activity associated with the remedial program other than routine inspection, maintenance, and monitoring;
- 15-day advanced notice of any proposed ground-intrusive activity pursuant to the Excavation Work Plan (EWP). If the ground-intrusive activity qualifies as a change of use as defined in 6 NYCRR Part 375, the above mentioned 60-day advance notice is also required.
- Notice within 48-hours of any damage or defect to the foundation, structures or ECs that reduces or has the potential to reduce the effectiveness of an EC, and likewise, any action to be taken to mitigate the damage or defect;
- Notice within 48 hours of any non-routine maintenance activities.
- Verbal notice by noon of the following day of any emergency, such as a fire, flood, or earthquake, that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, with written confirmation within 7 days that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public; and
- Follow-up status reports on actions taken to respond to any emergency event requiring ongoing responsive action submitted to NYSDEC within 45 days describing and documenting actions taken to restore the effectiveness of the ECs.

Any change in the ownership of the Site or the responsibility for implementing this SMP will include the following notifications:

- At least 60 days prior to the change, NYSDEC will be notified in writing of the proposed change. This will include a certification that the prospective purchaser/Remedial Party has been provided with a copy of the BCA and all approved work plans and reports, including this SMP; and
- Within 15 days after the transfer of all or part of the Site, the new owner's name, contact representative, and contact information will be confirmed in writing to NYSDEC.

In-Text Table 2 includes contact information for these notifications. The information on this table will be updated as necessary to provide accurate contact information. A full listing of site-related contact information is provided in In-Text Table 3.

In-Text Table 2
Notifications*

Company/Regulator	Contact Name	Contact Title	Contact Number
NYSDEC	Yildiz Palumbo	Project Manager	718-482-4891
	Andre Obligado	Chief, Superfund and Brownfield Cleanup Section	718-482-6412
	Kelly Lewandowski	Chief, Site Control	518-402-9553
NYSDOH	Steven Berninger	Project Manager	518-402-7860

Note: *Notifications are subject to change and will be updated as necessary.

In-Text Table 3
Site Contact List

Company	Individual Name	Title	Contact Number
AKRF	Marc Godick, QEP	Principal	914-922-2356 (office)
	Rebecca Kinal, P.E.	Remedial Engineer	914-922-2362 (office)
	Bryan Zieroff, CPG, LEP	Project Manager	914-922-2382 (office)
	Ben Hess	Deputy Project Manager	212-696-0670 (office)
DS 34 Berry LLC, DS 34 Berry II LLC, and DS 34 Berry III LLC	Michael Bacon	Volunteer's Representative	

2.0 SITE BACKGROUND

2.1 Site Location and Description

The Site is located in Brooklyn, Kings County, New York and is identified as Tax Block 2289, Lot 14 on the New York City Tax Map. The Site location is shown on Figure 1. The Site is an approximately 0.825-acre parcel bounded to the north by North 12th Street, to the east by Berry Street, to the south by North 11th Street and two low-rise residential buildings, and to the west by a warehouse building used by the Brooklyn Brewery. The surrounding area is primarily developed with residential and commercial uses, containing apartment buildings, businesses and storage warehouses. A Site plan is provided as Figure 2. The boundaries of the Site are more fully described in the EE, provided as Appendix A. The owners of the Site are currently DS 34 Berry LLC, DS 34 Berry II LLC, and DS 34 Berry III LLC.

2.2 Site History

A full Site history, including historical Sanborn maps and a summary of previous investigations conducted at the Site, was provided in the RAWP. Historic records indicated that the Site was developed as the New York Quinine and Chemical Works from approximately 1887 to 1951. From 1965 to 2006 (after decommissioning of the quinine factory), the Site was occupied by a large two-story freight loading facility and warehouse in the western portion of the Site, a two-story truck repair facility/warehouse and a four-story unspecified manufacturing facility in the southwestern portion of the Site, and a parking lot in the eastern portion of the Site containing two gasoline tanks of unspecified capacity. In 2006, the on-site buildings contained artist loft residences, a furniture manufacturer warehouse, a garage, a forklift sales and service facility, and an empty warehouse; and the eastern parking lot was used for vehicle parking and storage. All on-site buildings were demolished starting in April 2008, and construction of the existing residential structure started in June 2008. The current building construction was completed in early 2009 and the building has operated as a residential rental apartment building since 2010.

2.3 Physical Setting

2.3.1 Land Use

The Site consists of a 36,472-square foot, irregularly-shaped lot. The lot is occupied by an L-shaped, seven-story residential building that fronts Berry and North 12th Streets, with an open courtyard area located behind the building, in the central portion of the Site. A cellar level parking garage is located under the building and courtyard, with an entrance ramp located on North 11th Street. A small, street-level valet parking lot is also located along North 11th Street, immediately east of the garage entrance ramp. The ground floor consists of residential lobbies, residential units, community facility spaces including a gym and maintenance storage. Floors 2 through 7 consist of residential units. The Site is located within a special mixed use district MX-8 and is zoned as M1-2/R6A for light manufacturing and residential uses and is currently utilized as a residential apartment building.

2.3.2 Geology

Prior to redevelopment, soil beneath the Site consisted of fill comprising sand and silt, and gravel with concrete, rock, brick, asphalt, and wood from sidewalk grade to varying depths up to approximately 20 feet below grade, underlain by sand and silt, and gravel. The upper 15 feet of soil and fill from the western portion of the Site and the upper 10 to 13 feet of soil and fill from the eastern portion of the Site were excavated during remedial activities performed concurrently with redevelopment in 2008 and 2009 (prior to entry into the BCP). Select areas were excavated at that time to deeper depths ranging from 11 to 17 feet

below grade to accommodate installation of forms, footings, underpinning, and an elevator pit.

Shallow subsurface soils encountered during previous on-Site investigations completed before and after redevelopment included urban fill material containing brick, asphalt, and concrete fragments to approximately 6 to 10 feet below grade, underlain by apparent native silty sand and silt. Most of the fill was removed during development to construct the current structure between 2009 and 2010. Bedrock was not encountered during implementation of the remedy. United States Geological Survey reports indicate that the depth to bedrock at the Site is expected to be approximately 100 feet below ground surface. The current building footprint is shown on Figure 2. Geologic cross sections are shown in Figures 3 through 6. Site specific boring logs are provided in well construction logs in Appendix B.

2.3.3 Hydrogeology

The surface topography in the surrounding area is generally flat, gradually sloping to the northeast in the vicinity of the Site, with an area-wide gradual slope to the northwest towards the East River, which is located approximately 1,100 feet to the northwest. Based on reports compiled by the U.S. Geological Survey (Brooklyn, NY Quadrangle), the property lies at an elevation of approximately 20 feet above the National Geodetic Vertical Datum of 1929 (an approximation of mean sea level).

Based on local topography and previous environmental investigations, the dominant groundwater flow direction at the Site is to the north and northeast, with some variations to the northwest with a downward gradient. Historically, groundwater has been encountered at depths ranging from approximately 5 to 8 feet below the basement garage floor, which corresponds to approximate depths of approximately 11 to 14 feet below street level. Groundwater in Brooklyn is not used as a potable source. There are no surface water bodies or streams on or immediately adjacent to the Site. Groundwater elevation contour maps displaying groundwater flow under static conditions (June 2021), under Phase 1 pumping conditions (December 2021), and under Phase 2 pumping conditions (May 2022) at the Site are included as Figures 7 through 9. Please refer to quarterly or periodic review report submissions for contour maps from each quarterly monitoring and sampling event performed thereafter at the Site. Historic groundwater elevation data is provided in Table 1. Groundwater well construction logs are provided in Appendix B.

2.4 Summary of Regulatory Interaction Prior to Entering the BCP

During development in 2008, the Site was subject to New York City Office of Environmental Remediation (NYCOER) "E"-designation requirements for hazardous materials as part of the Greenpoint-Williamsburg Rezoning, which included preparation and implementation of an NYCOER-approved Remedial Action Plan (RAP) to address Soil Management at the Site. The RAP was designed to address issued identified during a June 2006 Subsurface (Phase II) Investigation Report (summarized in Section 2.5), which concluded that contaminated soil and groundwater were present at the Site including chlorinated solvent- and petroleum-related volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs), and metals detected in soil and/or groundwater. Site contamination appeared to be related to historic operations at the Site, placement of urban fill material of unknown origin by prior owners, and the presence of on-Site fuel oil storage tanks. The detections revealed evidence of a "spill" requiring reporting to the NYSDEC [Spill No. 07-12424 (the "Spill")].

Redevelopment of the Site was completed in December 2009 and included the demolition of the former buildings and the construction of a seven-story residential building, an open courtyard, and

basement level garage. Excavation extended between approximately 10 to 17 feet below grade throughout the building footprint. A March 2010 NYCOER-approved Closure Report, submitted as part of the "E" designation requirements for the Site, documented the remediation activities (documented in following Subsection 2.7), and NYCOER issued a Notice of No Objection (NNO) for the Site on April 20, 2010, which indicated that the E-designation requirements had been satisfied. On September 13, 2012, and in accordance with the NNO, a Notice of Satisfaction (NOS) was issued to the Volunteer after it entered into a Stipulation Agreement with the NYSDEC regarding remediation of the open Spill. The Stipulation Agreement specified the required investigations, remediation, and monitoring measures to be implemented with respect to light non-aqueous phase liquid (LNAPL) that remained in the saturated zone beneath the building slab at the Site in order to achieve Spill case closure.

To address the Spill, and under review and approval of NYSDEC, an LNAPL recovery system was installed at the end of building construction in early 2009 and expanded with the addition of two additional recovery wells in April 2012. Operations, monitoring, and maintenance (OM&M) of the NAPL system and submission of monitoring reports were conducted in accordance with an agreed upon schedule with the NYSDEC spill case manager. From September 2009 through December 2014, monthly OM&M visits and quarterly groundwater sampling were completed to monitor Site conditions and the effectiveness of the system. From January 2014 until entry into the BCP, quarterly OM&M visits with semi-annual groundwater sampling were completed. The results of each visit were compiled and reported to NYSDEC for review and approval. The OM&M program documented that the LNAPL system had been effective in reducing the amount of LNAPL beneath the building.

During the OM&M program, AKRF conducted additional subsurface investigations under NYSDEC oversight to further characterize subsurface conditions. In November 2010, AKRF performed an off-site investigation in accordance with an NYSDEC-approved work plan to determine whether potential off-site sources were contributing to petroleum contamination observed at the Site, including two manufactured gas plant (MGP) gas holders formerly located across North 12th Street. The combined field observations and laboratory analytical results indicated that the petroleum-related contamination at the 34 Berry Street Site was not likely originating from an off-Site source.

In April 2013 and July 2016, the Volunteer performed additional subsurface investigations to further investigate and potentially identify the source area for 1,2-dichlrorethane (1,2-DCA), which had been detected in MW-4 during on-going groundwater monitoring, and to address investigation data gaps for the Site. Each phase of additional investigation was completed in accordance with a NYSDEC-approved work plan. The groundwater sampling results confirmed that the concentrations of petroleum compounds were consistent with previous sampling events and exceeded the Ambient Water Quality Standards and Guidance Values (AWQSGVs) in the northeastern portion of the Site where the NAPL recovery wells are located. The groundwater sampling results identified 1,2-DCA concentrations in (MW-18 and MW-22) at one to two orders of magnitude greater than the on-Site monitoring wells. These sampling results, combined with the established groundwater flow direction, suggested that the 1,2-DCA source area may be located along the Site boundary between 34 Berry and 44 Berry Street, or may originate from the upgradient adjacent 44 Berry Street property. In March 2018, a BCA was executed between the Volunteer and the NYSDEC to complete remediation and investigation activities at the Site through the NYSDEC BCP.

2.5 Previous Reports

Phase I Environmental Site Assessment (ESA) – 34 Berry Street, Brooklyn, New York, Langan, June 15, 2006.

Langan performed a Phase I ESA of the Site to identify Recognized Environmental Conditions (RECs) that could affect redevelopment of the Site. The ESA identified the following RECs:

- Historic use of the Site as a chemical (quinine factory) from at least 1887 to 1951;
- Historic uses of the adjacent and surrounding properties, including an iron foundry, various manufacturing operations, and an MGP;
- On-site equipment repair and maintenance associated with a fork-lift company, including an associated solvent tub, stockpiles of batteries, waste oil drums, and an acetylene tank for welding;
- A 2,000-gallon UST documented in the building located southwest-adjacent to the Site; and
- Two vent stacks observed on the sidewalk across North 12th Street from the Site.

Based on these findings, Langan recommended a Phase II Environmental Site Investigation to determine whether soil and groundwater at the Site were affected by the identified RECs, including historical operation of the on-site building as a chemical factory from 1887 to 1951, current use of the on-site building as hydraulic lift equipment storage, and historic and current use of adjacent and surrounding properties.

Subsurface (Phase II) Investigation – 34 Berry Street, Brooklyn, New York, Langan, June 27, 2006.

Langan performed a subsurface investigation to determine whether the RECs identified during their Phase I ESA affected subsurface conditions at the Site. The Phase II Environmental Site Investigation (ESI) included advancing six soil borings (five on the Site, and one in the basement of an adjacent building at 111 North 11th Street), and collection of soil and groundwater samples from each boring. In addition, a groundwater sample was collected from an observation well installed during a geotechnical survey conducted by Langan. Soil samples were analyzed for VOCs, semivolatile organic compounds (SVOCs), metals, and polychlorinated biphenyls (PCBs); groundwater samples were analyzed for VOCs, SVOCs, and metals. Historic fill material was observed in all soil borings to depths of approximately 6 to 10 feet below grade, and petroleum-like odors were observed in three borings advanced in the northern portion of the Site, along North 12th Street, at approximately 6 to 12 feet below grade. SVOCs were detected at concentrations exceeding NYSDEC Technical and Administrative Guidance Memorandum (TAGM) Recommended Soil Cleanup Objectives (RSCOs) in effect at that time in two of the soil samples collected for laboratory analysis [EB-1b (2-2.5) and EB-3 (1-2)], and metals were detected above TAGM RSCOs in all soil borings. No VOCs or PCBs were detected in any of the soil samples analyzed. VOCs and SVOCs were detected above NYSDEC Class GA AWQSGVs in groundwater samples collected from two of the soil borings (EB-1 and EB-2), and metals were detected above the AWQSGVs in groundwater samples from all of the soil borings. Based on the findings of the Phase II ESI, Langan concluded that soil and groundwater conditions in the northern portion of the Site (generally along North 12th Street) were indicative of petroleum contamination requiring spill reporting to NYSDEC. Langan indicated that the soil and groundwater results for the remainder of the Site were characteristic of a typical urban fill site in New York City.

Environmental Subsurface Investigation Report – 34 Berry Street, Brooklyn, New York, Landmark Consultants, Inc., April 2007.

Landmark Consultants Inc. (Landmark) conducted a subsurface investigation of the Site to further delineate the petroleum contamination identified during Langan's June 2006 Phase II ESI. The investigation consisted of the advancement of 16 soil borings, including 10 borings in the loading

dock and factory bay areas of the on-site warehouse building (LDA-1 through LDA-6 and FBA-1 through FBA-4); and six borings in the parking lot area (EB-1 through EB-6). One to two grab soil samples were collected from each boring and analyzed for VOCs, SVOCs, and metals; two grab soil samples (from FBA-3 and FBA-4) were analyzed for total petroleum hydrocarbons (TPH) and PCBs; and one composite and two grab soil samples were analyzed for leachable VOCs, SVOCs, metals, pesticides, and herbicides by the Toxicity Characteristic Leaching Procedure (TCLP). In addition, one groundwater sample (GW-1) was collected from the northwestern portion of the Site and analyzed for VOCs and SVOCs. The VOC 2-butanone was detected in one soil sample (EB-1) at a concentration exceeding the TAGM RSCO; however, the presence of this compound was attributed to laboratory contamination, not on-site conditions. All other VOC concentrations in the soil samples were below their respective TAGM RSCOs.

Individual SVOCs were detected at concentrations exceeding their respective TAGM RSCOs in eight of the soil borings. The highest total SVOC concentration (62.9 ppm) was detected at 6 feet below grade in soil boring FBA-3, located in the northwestern portion of the Site. Metals were detected at concentrations above their respective TAGM RSCOs in each of the six soil borings advanced within the open parking lot area, while all metals concentrations in soil samples from the loading dock and freight bay areas were below TAGM RSCOs. Gasoline range total petroleum hydrocarbons (TPH) were detected in the samples collected from borings FBA-3 and FBA-4, at concentrations of 1,460 to 3,080 parts per million (ppm), respectively; no PCBs were detected in these samples. All contaminant concentrations in the samples analyzed by TCLP were below their respective hazardous waste thresholds. Several SVOCs, including 2-methylnaphthalene, benzo(a)pyrene, fluorene, and phenanthrene, were detected in the groundwater samples at concentrations exceeding their respective AWQSGVs. VOCs detected in groundwater were below their respective AWQSGVs.

Based on visual observations, screening with a photoionization detector (PID), and laboratory analytical results, Landmark concluded that petroleum-contaminated soil was present in an approximately 11,350-square foot area in the northern portion of the Site, near North 12th Street, to depths of approximately 9 feet below grade. Landmark estimated that approximately 3,800 cubic yards of contaminated soil would need to be excavated from this area to remediate the Site. In addition, Landmark recommended that any historic fill material excavated during proposed Site redevelopment be properly disposed at a permitted disposal facility.

Supplemental Remedial Investigation Report – 34 Berry Street, Brooklyn, New York, Landmark, March 20, 2008.

After a Spill was reported to NYSDEC on February 26, 2008 due to the petroleum contamination observed during previous investigations, and based on a request in a March 14, 2008 letter from NYSDEC, Landmark conducted a supplemental site investigation to further characterize subsurface conditions at the Site. The investigation included advancing 11 Geoprobe soil borings (EB-1 through EB-11) with continuous macro-core sampling to groundwater and collecting one soil sample from the most contaminated interval in each boring to be analyzed for VOCs and SVOCs. Landmark indicated that field screening identified slightly stained soil in one boring located near the southern Site boundary along North 11th Street, and four borings located along the western perimeter of the Site adjacent to the Brooklyn Brewery building. The stained soil was observed in discontinuous seams at depths ranging from 2 to 12 feet below grade. Individual SVOCs were detected in six of the borings (EB-6 through EB-11) at concentrations exceeding their respective TAGM RSCOs. All VOC concentrations were below their respective TAGM RSCOs.

Based on these results, Landmark refined the extent of petroleum-contaminated soil to an approximately 16,000 square foot area located along the northern and western portions of the Site. Further, Landmark indicated that all soil excavated from within the proposed development footprint

to accommodate the building foundation and basement parking garage, including the delineated petroleum-contaminated soil, would be removed in accordance with applicable regulations and that endpoint samples would be collected from the bottom of the excavation in accordance with NYSDEC guidance. In response to NYSDEC concerns regarding soil vapor intrusion, Landmark indicated that the basement parking garage would include a separate ventilation system and a sub-slab vapor barrier.

Remedial Action Plan and Construction Health and Safety Plan– 34 Berry Street, Brooklyn, New York, Landmark, February 2008.

The RAP presented measures for: handling, stockpiling, transportation, and disposal of excavated soil and fill material during construction; proper groundwater pre-treatment if dewatering was performed; and the implementation of vapor control for the future building. Excavated soil, excluding segregated petroleum-contaminated soil or hazardous waste, would be removed from the Site or reused as fill on-site, as necessary for construction. Contaminated and hazardous waste soil would be disposed of off-site in accordance with applicable federal, state, and local regulations.

The design for the vapor barrier consisted of Grace Preprufe® 300 waterproofing membrane applied to the underside of the foundation. The design also included a 6-inch thick layer of gravel placed below the vapor barrier. Any penetrations through the foundation would be sealed with Grace Bituthene® liquid membrane. The vapor barrier would serve to mitigate the potential vapors from entering the building from the subsurface and would also serve as a structural waterproofing system to prevent moisture from infiltrating through the foundation. In addition, the basement level of the proposed building would be used for vehicle parking and would contain a separate active ventilation system to prevent build-up of vehicle emissions. Since the underground portion of the building would be actively ventilated, the potential for vapor intrusion would be further reduced.

An air monitoring program was specified during disturbance of historic fill and contaminated soil to avoid or minimize exposure of the field personnel and the public to potential environmental hazards during soil disturbance activities. Proposed dust control measures included a dedicated on-site water truck, tarp covers for haul trucks, stabilized construction entrances, wash stations, and minimizing the speed of on-site vehicles. Proposed vapor/odor control measures included: limiting the area of open excavation; shrouding open excavations with tarps; using foams to cover exposed soils; and/or using chemical odorants in spray or misting systems.

The RAP also included contingency plans in the event that unknown USTs and/or areas of contaminated soil were encountered during soil excavation activities. Any USTs or areas of contaminated soil uncovered during the Site development would be addressed in accordance with accepted industry standards and applicable federal, state, and local regulatory agency requirements.

The Construction Health and Safety Plan (CHASP) assigned responsibilities, established personnel protection standards, defined mandatory safety practices and procedures and air monitoring requirements, and outlined contingency measures for unknown conditions that could arise during the remediation work associated with excavation and foundation work at the Site. The CHASP was intended to minimize health and safety risks resulting from the known and potential presence of hazardous materials on the Site.

New York City Department of Environmental Protection (NYCDEP)[1] approved the RAP and CHASP and issued a Notice to Proceed on April 3, 2008.

[1] E-designation sites were managed previously under the NYCDEP; in early 2009, these sites transitioned to the OER.

Soil Corrective Action and Remedial Subsurface Investigation – 34 Berry Street, Brooklyn, New York, Impact Environmental Restoration, Inc. (Impact), September 2008.

This report was prepared by Impact and submitted to NYSDEC and NYCDEP to document the excavation and off-site disposal of petroleum-contaminated soil from the Site. Soil removal operations, which were conducted between May 15 and August 1, 2008, included the excavation of approximately 18,977 tons of soil under the entire building footprint, with off-site disposal at four different disposal facilities. Waste characterization samples were collected prior to and during the soil excavation activities to gain acceptance of the material at the designated facilities. Following soil removal, the bottom of the excavation was field screened for evidence of contamination and 34 post-excavation grab samples were collected at depths of approximately 10 to 14 feet below grade. The samples were collected across a grid pattern on approximately 20-foot centers and analyzed for VOCs and SVOCs. Impact reported that soil at the bottom of the excavation generally consisted of coarse sand containing some cobbles and did not exhibit evidence of contamination or elevated PID readings; however, a reddish brown petroleum product was noted on the surface of the groundwater in the northern portion of the Site, along North 12th Street. Analytical results for the endpoint samples indicated that four of the samples contained VOCs or SVOCs slightly exceeding the TAGM RSCOs. Based on these results, Impact recommended installing six 4-inch diameter monitoring wells screened across the water table to monitor and recover LNAPL observed on the water table in the northern portion of the Site.

NYSDEC issued a November 19, 2008 letter indicating that, based on the data in Impact's report, no additional soil would need to be removed from the Site; however, continued LNAPL monitoring and recovery would be required.

Remedial Action Plan Addendum – 34 Berry Street, Brooklyn, New York, Landmark, April 2009.

An addendum to the RAP was prepared by Landmark to specify measures for addressing the LNAPL that was observed on the groundwater surface at the Site following soil removal operations. The presumed source of the LNAPL was 12 USTs that were uncovered and removed during soil excavation for the building foundation. The proposed remediation measures consisted of operation and maintenance of an LNAPL recovery system and periodic groundwater monitoring in observation wells installed around the system. The proposed system included pumping of LNAPL/groundwater from three recovery wells, with treatment of the extracted fluids using an oil/water separator, air stripper, particulate filter, and two granular activated carbon (GAC) units in series prior to being discharged to the NYCDEP sewer system. The RAP addendum specified an OM&M schedule and periodic reporting to NYSDEC. A May 5, 2009 letter from Landmark to NYSDEC provided supplementary pump test and LNAPL gauging data to support the LNAPL recovery system design.

Closure Report – 34 Berry Street, Brooklyn, New York, AKRF, March 2010.

AKRF prepared a Closure Report to document disposal, monitoring, and other remedial activities undertaken during construction activities at the Site in accordance with the NYCDEP-approved RAP and CHASP. All of the excavated fill material was sampled and disposed of off-site in accordance with applicable regulatory requirements. Engineering controls consisted of a vapor barrier and a site cap. The vapor barrier consisted of a Grace Preprufe® 300R waterproofing membrane, which was applied to the underside of the foundation. Grace Bituthene® 4000 membrane was applied to all foundation sidewalls to just below finished grade. Penetrations through the foundation were sealed with Grace Bituthene® liquid membrane. In addition to the vapor barrier, a separate ventilation system was installed for the basement level garage as per the New York City Department of Buildings (NYCDOB) requirements for an enclosed parking lot. The footprint of the building was excavated to a depth of at least 10 feet below grade and completely covered with a concrete cap (the building slab). A passive sub-slab depressurization system (SSDS)

was designed for and retrofitted into the lower level floor slab in March 2010. Based on the completion of the work specified in the RAP and CHASP, AKRF recommended that OER issue a NNO for the Site upon receipt of the addendum documenting SSDS installation.

Closure Report Addendum – 34 Berry Street, Brooklyn, New York, AKRF, April 9, 2010.

The Closure Report Addendum was prepared to document additional remedial activities conducted subsequent to the March 2010 Closure Report, including installation of a passive SSDS and paving of a small area in the western portion of the Site.

The passive SSDS was installed under the newly constructed building as an added safeguard against potential soil vapor intrusion. The system included four branches of 6-inch diameter perforated piping installed within an 18-inch layer of gravel, which was integrated with the 6-inch gravel layer previously installed under the entire slab during building construction. The 6-inch perforated piping transitioned to 4-inch diameter solid cast iron piping below the slab, which was connected to 4-inch diameter solid polyvinyl chloride (PVC) aboveground risers. The aboveground risers connected to a single 4-inch diameter discharge line mounted in the southeastern corner of the parking garage. The riser vents to the atmosphere through a 4-inch diameter cast iron stack with a wind-driven turbine terminating above the roof of the parking garage stairway enclosure, located on the western side of a street-level courtyard.

On March 26, 2010, Tectonic, Inc. of Staten Island, New York installed 6-inch thick concrete pavement in an approximately 20-foot by 50-foot area in the southeastern corner of the Site not underlain by the building slab. Following installation, the pavement was covered with a layer of mulch. This pavement was installed to complete the final site cap described in the March 2010 Closure Report.

Off-Site Investigation Report – 34 Berry Street, Brooklyn, New York, AKRF, November 24, 2010.

The Off-Site Investigation Report documented the results from an investigation of subsurface conditions north- and east-adjacent of the Site to determine if potential off-site sources were contributing to petroleum contamination observed at the property during Site redevelopment and subsequent remediation activities. Field evidence of contamination, including slight petroleum-like odors and a visible sheen, was noted below the water table in three soil borings immediately north of the Site and one boring located across North 12th Street from the Site, with no contamination noted in two other borings across North 12th Street or in two borings across Berry Street.

Laboratory analytical results for soil were consistent with these field observations, indicating generally higher levels of petroleum-related VOCs in soil samples from borings immediately north of the Site. LNAPL was not observed in any of the off-site monitoring wells during groundwater sampling activities or the tidal survey. Petroleum-related VOCs and/or SVOCs exceeding their respective AWQSGVs were detected in groundwater from MW-9 and MW-10 located immediately north of the Site, and MW-12 and MW-13, located across North 12th Street, with naphthalene concentrations of 37 to 79 parts per billion (ppb) reported in MW-13. However, the concentrations were all below 100 ppb and were not indicative of the presence of LNAPL. Fingerprint analysis of LNAPL samples collected from on-site monitoring wells indicated a product profile consistent with weathered diesel fuel/No. 2 fuel oil, and not consistent with residual coal tar associated with the MGP gas holders formerly located on the north side of North 12th Street.

The combined field observations and laboratory analytical results indicated that the petroleum-related contamination at the Site was not likely to have originated from on off-site source. Based on the finding of the off-site investigation, AKRF recommended evaluating modifications to the on-site LNAPL recovery system to help enhance LNAPL recovery rates and incorporating off-site

monitoring wells into the monthly fluid level gauging program to better evaluate groundwater flow direction and verify absence of LNAPL north and east of the Site.

Phase I Environmental Site Assessment (ESA) – 44 Berry Street, Brooklyn, New York, IVI Assessment Services, Inc., March 30, 2011.

IVI Assessment Services, Inc. (IVI) performed a Phase I ESA of the south-adjacent property at 44 Berry Street to identify RECs at the Site. In addition, the 44 Berry Street Phase I ESA summarized previous subsurface investigations performed at the 44 Berry Street site that were conducted to assess former UST areas, a former western dry well, and existing eastern dry well. The subsurface investigation included six borings drilled to 9 feet below basement slab. Soil samples from each boring were collected at the water table interface, which was approximately 3 feet below the basement slab. Groundwater samples were collected from temporary wells installed at each of the six boring locations. VOCs were not detected in any of the soil samples or groundwater samples. Hazardous lead waste identified in the soil sample collected from the eastern dry well. Remediation of the hazardous waste in the eastern dry well was completed and the drywell was closed. While 1,2-DCA was not detected in any samples, the sample depths at the 44 Berry Street were shallower than the observed contamination depth in SB-22D at the Site. Other than the summary included in the Phase I ESA report, the previous subsurface investigation reports were not provided to AKRF.

OM&M Status Report (May 1 to June 30, 2013) – 34 Berry Street, Brooklyn, New York, AKRF, July 25, 2013.

AKRF prepared the Quarterly Monitoring Report documenting OM&M of the LNAPL recovery system for three quarterly events over the period of May 1, 2013 through June 30, 2013. Additional activities during the reporting period included completion of an additional off-site investigation in June 2013. The additional investigation was conducted to determine the source of 1,2-DCA contamination in groundwater, which was identified in MW-4 during ongoing monitoring of the petroleum spill. The investigation included the drilling of soil borings and installation of monitoring wells at three upgradient locations (MW-17 through MW-19) to determine whether upgradient properties were contributing to Site contamination identified in MW-4.

Groundwater was encountered in the soil borings at approximately 10 to 11 feet below grade. No field evidence of contamination (e.g., sheens, odors, or elevated PID readings) was noted in the soil borings. Subsurface soils identified in the samplers generally consisted of miscellaneous fill (sand and gravel, with some organic material) extending to the bottom of each boring.

The soil sampling results did not identify a soil contamination source area. 1,2- DCA was detected in sample MW-18 at a concentration of 0.013 milligrams per kilogram (mg/kg), which was below the NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective (UUSCO) of 0.02 mg/kg. No other VOCs were detected in the soil samples. SVOCs were not detected in the soil samples. Groundwater sampling from the remaining on-site wells and off-site wells showed that petroleum-related VOCs and/or SVOCs exceeding their respective AWQSGVs were detected in groundwater from on-site wells MW-3, MW-6, MW-7, and MW-16, and from off-site well MW-18. Off-site monitoring well MW-18, which is upgradient of on-site monitoring well MW-4 and located in the sidewalk bordering the 34 Berry Street and 44 Berry Street properties, contained 1,2-DCA, 1,2-DCP, and TCE at concentrations higher than in on-site monitoring well MW-4. The groundwater sampling results for MW-18 suggested a potential off-site source for the 1,2-DCA detections.

OM&M Monitoring Report (February 1 to October 31, 2016) – 34 Berry Street, Brooklyn, New York, AKRF, February 6, 2017.

AKRF prepared the Quarterly Monitoring Report documenting OM&M of the LNAPL recovery system for three quarterly events for the period February 1, 2016 through October 26, 2016 (three

consecutive quarters). Additional activities during the reporting period included completion of a Supplemental Subsurface Investigation (SSI) in April 2013. The SSI included drilling and sampling of six soil borings, installation of three additional interior on-site monitoring wells (MW-22, MW-23, and MW-24), and two additional off-site monitoring wells (MW-20 and MW-21). The new wells were incorporated into the groundwater sampling program. MW-20 through MW-23 and soil boring SB-25 were completed to identify the potential source area and provide additional groundwater data associated with the existing 1,2-DCA plume. MW-24 was added to the investigation to provide soil and water quality data at the northwestern property boundary, which was a data gap for the Site.

Visible staining, petroleum-like odors, and elevated PID readings were observed in soil borings for MW-23 at 7 to 10 feet below basement grade (bbg) and MW-24 at 5 to 9 feet bbg. PID readings peaked at 30.4 ppm at MW-23 (8 feet bbg) and 153 ppm at MW-24 (8 feet bbg). No field evidence of contamination (e.g., sheens, odors, or elevated PID readings) was noted in the remaining soil borings.

The soil sampling results compiled during the June 2016 SSI indicated that low level VOC detections for solvent compounds were well below their respective UUSCOs and did not indicate the presence of a source area for the chlorinated solvent plume. The petroleum VOCs detected in on-site soil samples were below their respective UUSCOs and were consistent with the known contamination in the Spill area. The groundwater sampling results confirmed that the concentrations of petroleum compounds were consistent with previous sampling events, and exceeded the AWQSGVs in the northeastern portion of the property where the LNAPL recovery wells are located. The groundwater results identified 1,2-DCA concentrations in MW-18 and MW-22 at one to two orders of magnitude higher than in the other monitoring wells. These results, combined with the established groundwater flow direction, suggested that the 1,2-DCA source area may be located along the property boundary between the Site and 44 Berry Street, or may originate from the upgradient adjacent 44 Berry Street property.

OM&M Monitoring Reports – 34 Berry Street, Brooklyn, New York, AKRF, Inc., October 2009 through January 2020

The OM&M status reports prepared to document the LNAPL system performance were completed on quarterly or semi-annual bases during the following periods:

1. Monthly OM&M Status Reports, AKRF, October 2009 through December 2014
2. Quarterly (gauging)/Semi-Annual (gauging and groundwater monitoring) OM&M Status Reports, AKRF, January 2015 through January 2020

Prior to system start up, LNAPL was measured in the recovery wells at thicknesses ranging from approximately 0.2 to 0.6 foot. After the system was turned on in March 2009, NAPL was measured at thicknesses ranging from 0.5 foot in MW-2 to 4.79 feet in MW-1. This increased NAPL thickness was believed to be due to the capture zone created by depressing the water table into a cone of depression surrounding each recovery well, allowing the NAPL to essentially migrate "downhill" and build-up within the water table depression. NAPL recovery was effective after system start up, as over 1,000 gallons of NAPL were recovered by September 2010. Approximately 850 additional gallons of NAPL were recovered from October 2010 to October 2012, and approximately 150 additional gallons of NAPL were recovered from November 2012 to February 2018. Approximately 2,000 gallons of NAPL had been removed to date during the NAPL system operation. In November 2012, NYSDEC approved the permanent shutdown of MW-7, as NAPL was no longer detected at that location. During the February 2018 OM&M event, NAPL was detected in MW-1, MW-6 and MW-16 at thicknesses ranging from 0.10 and 0.35 foot. Neither

NAPL nor a petroleum sheen were detected in MW-2 or MW-3 during the February 2018 gauging events.

The OM&M program documented that the presence and thickness of measured NAPL was reduced throughout the duration of system operation. Each recovery well included periods of time during full system operation when NAPL was not detected. The system was effective in reducing the amount of NAPL beneath the Site building. Part of the reduction in NAPL recovery was also attributed to the deterioration of system equipment as it approached 10 years of operation. Repairing worn out equipment and cleaning bio-fouled pumps and discharge lines had become a constant maintenance requirement. In addition, replacement well MW-3R was completed to take the place of MW-3, where shifting of the PVC casing prevented the pump in MW-3 from operating properly or being removed. It became apparent that a full system rehabilitation with new pump and discharge lines was necessary to bring the system back to full operational capacity to address the remaining pockets of NAPL beneath the Site.

IRM Work Plan – 34 Berry Street, Brooklyn, New York, AKRF, March 2019

The OM&M program documented that the LNAPL recovery system had been effective in reducing the amount of LNAPL beneath the Site building, but aging equipment, part failures, and biofouling of the LNAPL system equipment had limited recent performance. The IRM Work Plan was prepared to identify the procedures to rehabilitate and repair the existing system to optimize LNAPL recovery and complete the LNAPL removal beneath the Site. NYSDEC approved the IRM Work Plan in March 2019, and the LNAPL system upgrades were completed in June 2019. The activities described in the IRM work plan were completed and documented in the OM&M Monitoring Report dated December 19, 2019 and submitted to NYSDEC.

After a complete system rehab, the LNAPL system was restarted in June 2019. Approximately 68 gallons of LNAPL was removed between June and December 2019, and after six months of operation the NAPL removal rate returned to a rate consistent with conditions prior to the system upgrade.

Remedial Investigation Report – 34 Berry Street, Brooklyn, New York, AKRF, November 2019

The Remedial Investigation (RI) was submitted NYSDEC in October 2019 and, combined with the results from all preceding investigations, confirmed the following:

- Groundwater under static non-pumping conditions flows in the north-northeast direction beneath the Site, with a regional trend to the northwest beyond North 12th Street. The groundwater flow direction follows topography;
- Petroleum contamination in soil is related to two distinct LNAPL zones, with a small zone near MW-1 on the eastern side of the Site, and a larger zone surrounding MW-2, MW-3, MW-6, and MW-16 on the western side of the Site. Fingerprint analysis identified the LNAPL as fuel oil. The soil contamination in these zones was not observed as a distinct point source, but rather it was as a smear zone created by the LNAPL moving with groundwater fluctuations;
- Solvent contamination in soil was documented in one sample from boring SB-22D located along the southeastern border of the Site at a depth of 14 to 15 feet below the basement level garage floor (approximately 5 feet below the water table);
- Petroleum contamination in groundwater included benzene and toluene detected above their NYSDEC AWQSGVs in up to three monitoring wells. The remaining petroleum-related BTEX (ethylbenzene and xylenes) compounds detected in the groundwater samples were below their respective AWQSGVs. There were no other petroleum-related VOCs detected above their respective AWQSGVs in the groundwater samples collected during RI. The RIR, combined with all preceding investigations, have

documented that petroleum contamination in groundwater is related to the two distinct NAPL zones described above;

- Solvent contamination in groundwater was associated with the detection of 1,2-DCA in eight monitoring wells at concentrations that exceeded its AWQSGV. Additional solvent-related VOCs, including tetrachloroethylene (PCE), trichloroethylene (TCE), 1,2-dichloropropane (1,2-DCP), chlorobenzene, and chloroform were present at lower concentrations, with concentrations exceeding the NYSDEC AWQSGVs in up to five monitoring wells.
- The concentration of 1,2-DCA in groundwater samples collected from the off-site monitoring well MW-18 and the on-site deep monitoring well MW-22D were an order of magnitude higher compared to the other monitoring wells. This pattern was consistent with historical sampling results, which had identified the highest concentrations of 1,2-DCA in the area of MW-4, MW-18, and MW-22. The higher concentration in MW-22D (screened at 30-35 feet below the water table) compared to MW-22 (screened across the water table) is consistent with the downward groundwater flow gradient identified at the site, and the tendency for 1,2-DCA, which is denser than water, to sink in an aquifer. Isoconcentration contours prepared as part of the RI for suggests that the 1,2-DCA source area extends upgradient from MW-22D on the adjacent property.
- Groundwater samples were analyzed for emerging contaminants [1,4-dioxane, Perfluorooctanoic Acid, and Per- and Polyfluoroalkyl Substances (PFOA/PFAS) compounds] at the request of the NYSDEC. The groundwater samples were analyzed for the standard list of 21 PFOA and PFAS compounds by EPA Method 537 (modified) and 1,4-dioxane by EPA Method 8270D – SIM. Thirteen of the 21 PFOA and PFAS compounds were detected in one or more groundwater samples at concentrations ranging from an estimated 0.25J parts per trillion (ppt) (MW-5) to 1,160 ppt (MW-7). 1,4-Dioxane was detected in 10 of the 17 groundwater samples at concentrations ranging from an estimated concentration of 0.16 µg/L (MW-10) to 0.69 µg/L. (MW-22D).
- The RIWP had proposed investigation at the adjacent property located at 44 Berry Street to determine whether the source of the 1,2-DCA contamination in groundwater originated from and/or extended onto that property. Access was denied by the 44 Berry Street property owner, and the related off-site investigation described in the RIWP was not conducted as part of the RI.
- The analytical results for soil gas indicated there were no 1,2-DCA hot spots detected in any of the three soil gas samples for both the October 2018 and August 2019 sampling events at the Site. 1,2-DCA was not detected in any of the indoor air samples. TCE was detected in the soil gas sample SG-1 (near MW-4 in the southeastern portion of the basement) during the October 2018 sampling event at 12 µg/m^3. The corresponding indoor air sample, IA-01, had a detection of TCE at 0.21 mg/m^3. The NYSDOH matrices indicated for the October 2018 sampling event that additional monitoring for TCE was recommended to determine if additional actions, such as mitigation, are warranted. An additional round of sampling was completed in August 2019 and TCE was not detected in any of the samples (soil gas or indoor air). The results of the second round of sampling, combined with the fact that mitigation measures including a vapor barrier, passive SSDS, and cellar air exchange system were already in place at the Site, additional monitoring was not necessary provided that the existing mitigation measures were properly maintained as an engineering control for the Site. BTEX compounds were expected to be present below the Site building slab due to the petroleum spill in the three soil gas samples for both sampling events, but were at low levels for all corresponding indoor air samples, especially since gasoline vehicles park in the basement garage.

  Soil Vapor Investigation – 44 Berry Street, Brooklyn, New York, Roux Environmental Engineering and Geology, D.P.C., May 9, 2019.

  On behalf of CLPF-44 Berry, LP (the "Owner" of 44 Berry Street), Roux Environmental Engineering and Geology, D.P.C. ("Roux") conducted soil vapor sampling at 44 Berry Street,

Brooklyn, NY. On August 6, 2018, Roux submitted data previously collected at the Site to the NYSDEC in support of Roux's request for the NYSDEC to reconsider AKRF's Remedial Investigation and remove all sampling proposed for the Site. While the NYSDEC agreed with Roux's request and modified AKRF's Remedial Investigation, NYSDEC requested the Owner collect soil vapor and indoor air at the Site to understand if there is a potential impact to the Site from contamination previously identified on the 34 Berry Street property. However, the investigation did not include soil or groundwater sampling to determine whether the source of the 1,2-DCA contamination in groundwater originated from and/or extended on to the 44 Berry Street property.

On March 12, 2019, Roux installed two sub-slab soil vapor monitoring points in the basement of the building. One soil vapor monitoring point was located in the electric room (SV-10). A second soil vapor monitoring point was located in the emergency exit hallway leading from a commercial tenant that operates a bar (SV-102). Soil vapor monitoring points consisted of a stainless-steel Vapor Pin® and silicone sleeve installed in a 5/8-inch diameter hole drilled through the floor. 1,2-DCA was detected in the sub-slab soil vapor sample SV-101 at a concentration of 14 µg/m^3, which was an order of magnitude higher than any sub-slab 1,2-DCA soil vapor detections at the Site (highest detection was 1.3 µg/m^3). The corresponding indoor air sample did not detect 1,2-DCA (reported detection limit of 0.809 µg/m^3). In addition, 1,2-DCA was not detected in the second sampling pair (sub-slab sample SV-102 and indoor air sample AS-102) or the outdoor air sample (OA-103), all at the reported detection limit of 0.809 µg/m^3.

Additional Indoor Air Investigation – 44 Berry Street, Brooklyn, New York, Roux Environmental Engineering and Geology, D.P.C., August 13, 2019.

In March 2019, at the request of the NYSDEC, Roux collected indoor air samples at the 44 Berry Street site. These samples were collected to determine if 1,2-DCA, which had been identified in groundwater at the Site, was impacting indoor air at 44 Berry Street. As part of that investigation, two indoor air samples were collected from the basement of the 44 Berry Street site (IA-101 and IA-102) and one outdoor air sample was collected on the Berry Street sidewalk (OA-103). 1,2-DCA was not identified during the March 2019 investigation. In addition to assessing 1,2-DCA, the March 2019 sampling identified the compound TCE in both indoor and outdoor samples. The NYSDEC subsequently requested additional sampling to assess both the TCE and the indoor air of a commercial tenant space at the Site. As NYSDEC requested, on June 27, 2019, Roux collected a total of six indoor air samples at the 44 Berry Street building. These included resampling the three original locations (IA-101, IA-102, and OA-103), two indoor air samples from Berry Cleaners located on the first floor of the 44 Berry Street building (IA-201 and IA-202), and a second outdoor air sample from the North 11th Street sidewalk (OA-104). All air samples were collected concurrently over an eight-hour period using laboratory supplied vacuum canisters and regulators. Samples were submitted to Alpha Analytical, a NYSDOH Environmental Laboratory Approval Program (ELAP)-certified laboratory, for analysis of volatile organic compounds using United States Environmental Protection Agency (EPA) Method TO-15.

In the June 2019 sampling event, there were no detections of 1,2-DCA in indoor or outdoor air. TCE was detected in indoor air at concentrations ranging from of 3.24 µg/m^3 in IA-102 to 90.8 µg/m^3 in IA-202 and in outdoor air at concentrations ranging from non-detect in OA-104 to 1.6 µg/m^3 in OA-103. Based on the investigations completed by Roux, NYSDEC indicated that 1,2-DCA contamination at the Site was not affecting indoor air at the 44 Berry Street site. However, the investigation did not include soil or groundwater sampling to determine whether the source of the 1,2-DCA contamination in groundwater at the Site originated from and/or extended on to the 44 Berry Street property.

Pre-Design Investigation Work Plan – 34 Berry Street, Brooklyn, New York, AKRF, June 2020

The Pre-Design Investigation Work Plan (PDIWP) was prepared to describe the activities to be performed to develop the design of the remedial action within the RAWP. THE PDIWP activities included:

- Completion of the previously postponed quarterly monitoring well gauging event from March 2020.
- Completion of baseline groundwater sampling from on-site monitoring wells that did not exhibit measurable LNAPL and a select set of off-site wells for VOCs and SVOCs (Base Neutrals only).
- Sample four monitoring wells for additional parameters including general chemistry parameters for treatability and to monitor natural attenuation capabilities.

Remedial Investigation Report Addendum – 34 Berry Street, Brooklyn, New York, AKRF, October 19, 2020

The RIR addendum letter was prepared when NYSDEC requested that the Volunteer conduct additional sampling to satisfy the RI requirements of the BCP for the Site. This request was made following NYSDEC's and NYSDOH's review of the initial RIR dated October 2019 and the draft RAWP dated May 2020. Specifically, NYSDEC requested that additional soil samples be collected and analyzed for herbicides, pesticides, PCBs, metals, and emerging contaminants. The additional sampling was conducted as a Pre-Design Investigation (PDI) in accordance with a scope outlined in email correspondence dated August 4, 2019, which was approved by NYSDEC on the same day via email. Three soil borings were advanced as part of the PDI. The RIR addendum, which was approved on January 11, 2021, confirmed the following:

- Strong petroleum-like odors, petroleum-like staining and visible NAPL, and organic vapors were detected, with a maximum PID reading of 58.5 ppm in the soil cores from 5 to 10 feet below grade at RW-2. The petroleum-like odors, visible staining, and PID readings observed in RW-1, RW-2, and RW-3 were most likely attributable to the previously-documented petroleum spill in the western portion of the Site.
- Two metals (hexavalent chromium and trivalent chromium) were detected above applicable UUSCOs and/or RRSCOs in soil sample RW-3_5-7_20200813 but below their respective Commercial Use Soil Cleanup Objectives (CUSCOs). One pesticide (4,4'-DDT) was detected in soil sample RW-3_5-7_20200813 at an estimated concentration above its UUSCO, but below its RRSCO. The exceedances were likely attributable to historic fill.
- All remaining parameters were below their respective UUSCOs, and the emerging contaminants were below the guidance values.
- The Site is covered with concrete slabs, paving, and/or a minimum of 2 feet of clean soil in landscaped areas, which prevents direct contact with the subsurface soil. The RAWP and FER included formalizing the existing Site cover as an Engineering Control under the BCP to prevent direct contact with subsurface soil

Remedial Action Work Plan (RAWP) - 34 Berry Street, Brooklyn, New York, AKRF, Inc., November 2020

AKRF prepared a RAWP in November 2020 that outlined the remedial activities and cleanup objectives for the Site. The RAWP proposed:

- The implementation of a two phase in-situ remediation program including groundwater and NAPL recovery, injections with groundwater recirculation, followed by natural attenuation to address contaminated soil and groundwater;

- A CAMP to be implemented during all intrusive Site activities;
- Soil removal/treatment as necessary to achieve a Track 4 Restricted Residential use cleanup remedy;
- Maintenance of the existing vapor barrier below the entire extent of the foundation slab, passive SSDS below the parking garage area, and parking area ventilation systems as engineering controls for cellar level of the building;
- Remedy performance monitoring to confirm that the soil, groundwater, and soil vapor remedies are effective in achieving the RAOs;
- The imposition of an Institutional Control (IC) in the form of an EE for the Site that will: require the remedial party/Site owner to complete and submit a periodic certification of ICs and Engineering Controls (ECs) to the Department in accordance with Part 375-1.8 (h)(3); allow the use and development of the Site for restricted residential use as defined by Part 375-1.8(g), although land use is subject to local zoning laws; restrict the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH; and require compliance with the Department-approved SMP;
- The EE will also include a listing of engineering controls and institutional controls and notice that these controls must be maintained in accordance with an SMP to prevent future exposure to residual contamination until future sampling demonstrates such controls are no longer necessary; and
- Preparation of a SMP for long term management of residual contamination as required by the EE, including plans for: 1) ICs and Engineering Controls (ECs), 2) monitoring, 3) operation and maintenance, and 4) reporting.

RAWP approval and the DD were both issued on February 9, 2021.

Remedial Action Work Plan (RAWP) Addendum - 34 Berry Street, Brooklyn, New York, AKRF, Inc., January 26, 2021

AKRF prepared a RAWP Addendum in January 2021 that outlined additional details pertaining to the proposed sub-slab soil vapor monitoring described in the Remedial Action section of the RAWP. Sub-slab soil vapor monitoring would be performed prior to, during, and following the Remedial Action including baseline sub-slab soil vapor sampling prior to starting Phase 1 of remediation; intermediate sub-slab soil vapor monitoring sampling performed during the middle of Phase 1 remediation and Phase 2 remediation; and post-remediation sub-slab soil vapor sampling following completion of remediation.

In-Situ Design Document (ISDD) - 34 Berry Street, Brooklyn, New York, AKRF, Inc., January 2021

AKRF prepared an In-Situ Design Document (ISDD) in December 2020 to outline the precise method, dosage, location, and depth of injection points and recovery wells to be utilized to remediate LNAPL and dissolved phase petroleum and solvent contamination beneath the Site in groundwater and soil below the water table. The ISDD summarized the results of the baseline groundwater monitoring events, rising and falling head slug tests, treatability study results, and groundwater flow modeling. The remedial design for groundwater treatment included two phases. Phase 1 would initially address residual and free phase LNAPL through surfactant injection and recovery using a groundwater recirculation system. The removal of LNAPL, to the extent practicable, would allow for the subsequent Phase 2 bioremediation treatment phase, where oxygen would be infused into the recirculated groundwater to promote aerobic bioremediation. The aerobic bioremediation would address residual dissolved phase petroleum compounds, including benzene and toluene, and the shallow 1,2-DCA plume and soil source near MW-22D. The ISDD also summarized the injection strategies, reagent analysis and selection, remediation equipment and materials, and proposed intermediate and post-treatment monitoring. The ISDD was determined to

satisfy the requirements of DER-10 and the BCA and was approved by NYSDEC on March 3, 2021.

OM&M Report – 34 Berry Street, Brooklyn, New York, AKRF, Inc., November 17, 2021

The OM&M report was prepared to document the Phase 1 groundwater treatment system operation and performance, Phase 1 intermediate groundwater and sub-slab soil vapor sampling results, and groundwater and NAPL gauging results. The OM&M report included data from two separate periods:

1. January 2, 2021 through March 15, 2021, which was the final operation period of the former NAPL recovery system; and
2. June 21, 2021 through September 30, 2021, which included the startup and operation of the newly installed and upgraded NAPL recovery and groundwater recirculation system.

Prior to Phase 1 treatment system start up, LNAPL was measured in the monitoring wells at thicknesses ranging from a sheen to 1.22 feet between January and March 2021. After the newly-installed system was turned on in early July 2021, NAPL was measured at thicknesses ranging from a sheen to 0.69 feet. Prior to treatment system upgrades, approximately 2 gallons of NAPL was recovered over an estimated 83 days of operation from January 2, 2021, through March 25, 2021. Following system upgrades for Phase 1 treatment and system restart in June 2021, approximately 45 gallons of NAPL were recovered over an estimated 44 days of operation through September 30, 2021. The June 2021 to September 2021 NAPL removal rate under the newly upgraded treatment system was two orders of magnitude higher than the January 2021 to March 2021 NAPL removal rate under the previous system. The OM&M program documented that the presence and thickness of measured NAPL was reduced throughout the duration of the upgrade Phase 1 treatment system operation.

Groundwater results indicated that petroleum-related VOCs were detected at concentrations similar to or slightly lower than the three baseline sampling events performed prior to the beginning of the remedial action. Solvent related VOCs and SVOCs were detected at concentrations lower than the three baseline sampling events performed prior to the beginning of the remedial action. Additionally, monitoring wells were sampled for Methyl Blue Active Substances (MBAS) to determine the presence of surfactant within groundwater in connection with the ongoing Phase 1 of the remedial action. MBAS results indicated that the surfactant injection was resulting in groundwater conditions that were indicative of surfactants being present in groundwater to increase the mobilization of NAPL within the capture zone of the recovery wells. Four sub-slab soil gas samples were collected from the four newly installed permanent sub-slab soil gas points in the basement. The sub-slab soil gas results indicated that petroleum related VOCs were lower than the previous sampling events, and solvent-related VOC detections were consistent with the RI sampling results, where a no further action was established, and infer that the remediation efforts had not affected sub-slab vapor.

Site Management Plan – 34 Berry Street, Brooklyn, New York, AKRF, Inc., October 2022

AKRF prepared an SMP, which was required as part of the Track 4 remedy. The SMP outlines the post-remedy phase inspection, operation, and monitoring requirements for the Site. The SMP includes a scope of work for inspecting and maintaining the Site cap, continued OM&M of the groundwater recirculation system, and Institutional and Engineering Controls (ICs and ECs) for the Site to control exposure to remaining contamination to ensure protection of public health and the environment. An Environmental Easement granted to the NYSDEC, and recorded with the NYC Office of the County Register, requires compliance with the SMP and all ECs and ICs placed on the Site. The SMP addresses the means for implementing the ICs and ECs that are required by the

Environmental Easement for the Site. NYSDEC, in consultation with NYSDOH, issued approval of the SMP on October 20, 2022.

Final Engineering Report – 34 Berry Street, Brooklyn, New York, AKRF, Inc., November 2022

The Final Engineering Report (FER) includes a full documentation of site history, applicable regulations, remedial action objectives, and a detailed accounting of each phase of remediation that was conducted in accordance with NYSDEC's Decision Document and the NYSDEC-approved RAWP and In-Situ Design Document (ISDD). The remedial actions included completion of a remedial design field program, installation of injection and recovery wells, soil excavation, soil import and restoration of the site cover system, implementation of two phases of groundwater treatment that included NAPL removal and in-situ bioremediation with oxygen infusion, operation and maintenance of the groundwater recovery and recirculation system, remedial performance monitoring and reporting, the recording of institutional control/environmental easement, and preparation of the SMP for long term management of residual contamination.

Periodic Review Report – 34 Berry Street, Brooklyn, New York, AKRF, Inc., May 2024

The Periodic Review Report (PRR) was prepared to document the Site management activities and findings for the first period of Site Management (December 2022 through April 2024), which included a certification that the site controls were being implemented in accordance with the SMP. Based on the inspections and data summarized in the PRR, the report included the following conclusions and recommendations:

- The IC/EC Certification Form for the Site was completed based on results from the Site monitoring and inspections, and the findings indicated that all ICs/ECs at the Site remained in place and effective.
- Operation of the groundwater treatment system continued to provide the aquifer stresses necessary to remove the residual pockets of light non-aqueous phase liquid (LNAPL) remaining at the Site, with monitoring data indicating that conditions could be approaching complete removal of measurable NAPL in the monitoring wells.
- Groundwater monitoring confirmed that the remediation conducted at the Site was effective and operation of the groundwater remediation system continued to show a positive influence on aquifer conditions during Site Management.
- Operation, monitoring, and maintenance (OM&M) of the groundwater remediation system, including quarterly gauging and groundwater sampling, should continue as described in the SMP.
- Based on the sampling history, and the groundwater sampling results during the reporting period, AKRF recommended removing MW-8, MW-9, and MW-21 from the groundwater sampling program.

Periodic Review Report – 34 Berry Street, Brooklyn, New York, AKRF, Inc., May 2025

The Periodic Review Report (PRR) was prepared to document the Site management activities and findings for the first period of Site Management (April 2024 through April 2025), which included a certification that the site controls were being implemented in accordance with the SMP. Based on the inspections and data summarized in the PRR, the report included the following conclusions and recommendations:

- The IC/EC Certification Form for the Site was completed based on results from the Site monitoring and inspections described in this report. The monitoring and inspection findings indicate that all ICs/ECs at the Site remain in place and effective.

- Operation of the groundwater treatment system continues to provide the aquifer stresses necessary to remove the residual pockets of light non-aqueous phase liquid (LNAPL) remaining at the Site, with monitoring data indicating that conditions could be approaching complete removal of measurable NAPL in the monitoring wells.
- Groundwater monitoring conducted as part of this PRR confirms that the remediation conducted at the Site was effective and operation of the groundwater remediation system continues to show a positive influence on aquifer conditions during Site Management.
- Operation, monitoring, and maintenance (OM&M) of the groundwater remediation system should continue as described in the SMP.

Periodic Review Report – 34 Berry Street, Brooklyn, New York, AKRF, Inc., May 2026

The Periodic Review Report (PRR) was prepared to document the Site management activities and findings for the first period of Site Management (April 2025 through April 2026), which included a certification that the site controls were being implemented in accordance with the SMP. Based on the inspections and data summarized in the PRR, the report included the following conclusions and recommendations:

- The IC/EC Certification Form for the Site was completed based on results from the Site monitoring and inspections described in this report. The monitoring and inspection findings indicate that all ICs/ECs at the Site remain in place and effective.
- Operation of the groundwater treatment system continues to provide the aquifer stresses necessary to remove the residual pockets of light non-aqueous phase liquid (LNAPL) remaining at the Site, with monitoring data indicating that conditions could be approaching complete removal of measurable NAPL in the monitoring wells.
- Groundwater monitoring conducted as part of this PRR confirms that the remediation conducted at the Site was effective and operation of the groundwater remediation system continues to show a positive influence on aquifer conditions during Site Management.
- Operation, monitoring, and maintenance (OM&M) of the groundwater remediation system should continue as described in the SMP.

Based on the results of the groundwater monitoring program, AKRF recommended a reduction in the number of wells, monitoring frequency, and/or the laboratory parameters that are currently included as part of the site management requirements listed in the SMP, in the December 2025 quarterly monitoring report. The two modification requests are listed below.

Recommendation #1:

The groundwater monitoring program (conducted since 2010) has shown that the remediation system has been effective in addressing dissolved VOC contamination, specifically 1,2-DCA (and to a lesser extent, 1,2-DCP, PCE, TCE, and BTEX), in the shallow aquifer. A consistent decreasing or asymptotic trend of 1,2-DCA (along with the lower-level detections) has been established during site management period (December 2022 to present – See Table 2), therefore, Request #1 was for a reduction in the number and frequency of wells to be sampled as part of the groundwater monitoring program. The proposed frequency included:

- MW-02, MW-06, MW-20, MW-22, and MW-22D: no change.
- MW-03R, MW-04, MW-05, MW-10, and MW-18: quarterly to semi-annual.
- MW-01, MW-23, MW-24, and MW-26: quarterly to annual.
- MW-07 and MW-16: discontinue groundwater monitoring.

Recommendation #2:

The SMP includes SVOC analysis for all on-site monitoring wells that are included as part of site management. As shown in Table 3, SVOCs are typically not detected, or are sporadically detected at concentrations below the AWQGVs. When anomalous detections in MW-02, MW-3R, and MW-22 (during 2022 and 2023) were above the AWQGVs, the SVOC was not detected during the preceding and following sampling events. There was only one SVOC compound that was detected above its respective AWQGV during the 2025-2026 reporting period (benzo[a]anthracene detected at a concentration of an estimated 0.65 µg/l in March 2025). Based on these results, AKRF recommended that analysis for SVOCs is discontinued during site management.

2.6 Summary of Remedial Actions Prior to Entering the BCP

Remedial actions were performed at the Site in accordance with the April 2008 NYCDEP-approved RAP, Stipulation Agreement with NYSDEC, and all applicable federal, state, and local rules and regulations. The following is a summary of the Remedial Actions performed at the Site prior to entering the BCP:

1. Excavation and disposal of approximately 18,676 tons of soil excavated during Site redevelopment activities. All soil was removed until field monitoring did not indicate evidence of contamination, or until reaching groundwater at approximately 13 to 14 feet below grade;
2. Removal of three gasoline underground storage tanks and nine diesel underground storage tanks during foundation excavation;
3. Installation of a vapor barrier consisting of a Grace Preprufe® 300R waterproofing membrane, which was applied to the underside of the foundation and Grace Bituthene® 4000 membrane applied to all foundation sidewalls to just below finished grade;
4. Installation of a passive sub-slab depressurization system as an added safeguard against the potential for soil vapor intrusion. The system includes four branches of 6-inch diameter perforated piping installed within an 18-inch layer of gravel, which is integrated with the 6-inch gravel layer previously installed under the entire slab during building construction. The 6-inch perforated piping transitioned to 4-inch diameter solid cast iron piping below the slab, which is connected to 4-inch diameter solid PVC aboveground risers. The aboveground risers are connected to a single 4-inch diameter discharge line mounted in the southeastern corner of the parking garage. The riser vents to the atmosphere through a 4-inch diameter cast iron stack with a wind-driven turbine terminating above the roof of the parking garage stairway enclosure, located on the western side of a street-level courtyard. The SSDS design includes contingency specifications for blower installation in the event that active venting is required. In addition, a separate ventilation system was installed for the basement level garage as per NYCDOB requirements for an enclosed parking lot. The location and components of the SSDS are shown on Figure 15. SSDS as-built drawings are included in Appendix I;
5. Installation of a Site cap consisting of the concrete building slab and concrete parking areas;
6. Completion of additional subsurface investigations to further characterize subsurface conditions and investigate and potentially identify the source area for 1,2-DCA;
7. Operation of the LNAPL recovery system from 2011 to 2018. The recovery system recovered approximately 2,000-gallons of LNAPL and properly disposed of the recovered LNAPL off-site.

Additional details pertaining to the remedial actions performed prior to the BCP are summarized in the 2010 Closure Report, Closure Report Addendum, and subsequent quarterly OM&M reports.

2.7 BCP-Established Remedial Action Objectives

The BCP Remedial Action Objectives (RAOs) established for the Site through the remedy selection process stated in 6 NYCRR Part 375, as listed in the DD dated February 2021, are as follows:

2.7.1 Groundwater

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Restore groundwater aquifer to pre-disposal/pre-release conditions, to the extent practicable.
- Remove the source of ground or surface water contamination.

2.7.2 Soil

RAOs for Public Health Protection

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

RAOs for Environmental Protection

- Prevent migration of contaminants that would results in groundwater or surface water contamination.

2.7.3 Soil Vapor

RAOs for Public Health Protection

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

2.8 Summary of Remedial Actions Under the BCP

Remedial actions were performed at the Site in accordance with the NYSDEC-approved November 2020 RAWP, January 2021 ISDD, and February 2021 DD, and all applicable federal, state, and local rules and regulations. Remedial activities during the BCP remedy phase began at the Site in March 2021 and continued through the summer of 2022. NAPL recovery and treatment of the dissolved contamination in groundwater are continuing under the Site Management (SM) phase following issuance of the Certificate of Completion.

The following is a summary of the Remedial Actions performed at the Site under the BCP:

1. Installation of seven injection wells (IW-01 through IW-07), retrofitting of three existing recovery wells to injection wells (IW-08 through IW-10), and installation of three additional recovery wells (RW-01 through RW-03) as part of upgrading the existing groundwater treatment system. The upgrades expanded the capabilities of the existing system to include an enhanced LNAPL recovery system, bioremediation recirculation system, and additional groundwater recovery locations. The new recovery and injection well locations, installed within the basement level parking garage and along the exterior sidewalk, were selected based on groundwater modeling to optimize groundwater recirculation and hydraulic control within

the treatment area(s). Additional details pertaining to the well installation activities are included in the FER. Injection and recovery well locations are shown on Figure 10. The injection and recovery well construction logs are included as Appendix B.

2. Four permanent sub-slab soil gas points (SG-01 through SG-04, as shown on Figure 10) were installed in the basement for periodic sub-slab soil gas monitoring during the remediation phase. Sub-slab soil vapor monitoring included sampling of sub-slab vapors prior to the groundwater treatment system start-up (baseline) and at designated intervals throughout the two phases of remediation. The results were compared to the baseline conditions established in the RI, and prior to system start-up, to confirm whether the remediation process was resulting in a vapor build-up beneath the floor slab. The results documented that there were no changes observed relative to baseline conditions, operation of the remediation system was not resulting in a buildup beneath the basement slab, and no additional mitigation controls, beyond the passive SSDS system, would be required provided that the existing mitigation measures are properly maintained under SM as an engineering control for the Site;
3. Excavation of approximately 9.92 tons of soil/fill from immediately below the basement garage and exterior sidewalk concrete slab, to a depth of approximately 2 feet below corresponding grade, to perform trenching and installation of conveyance piping for the injection well fluid lines and the recovery well fluid and air lines. All excavated material was contained and stored in accordance with the RAWP, and transported off-site for proper disposal at approved facilities. During all excavation and ground-intrusive activities, AKRF conducted real-time air monitoring for particulates and VOCs in accordance with the Community Air Monitoring Plan (CAMP) included in the NYSDEC-approved RAWP;
4. In-situ treatment of contaminated groundwater beneath the Site through the operation of an upgraded groundwater treatment and recirculation system through two phases of remediation. The first phase of remediation addressed the LNAPL areas by modifying the existing recovery and treatment system to include surfactant injection and groundwater recirculation. The second phase addressed the solvent contamination as well as the residual petroleum contamination by reconfiguring and expanding the system to include oxygen-enhanced groundwater recirculation to enhance in-situ bioremediation. As of May 25, 2022, approximately 304,000 gallons of groundwater were recovered, treated, and discharged to the sanitary sewer under a NYCDEP discharge permit and approximately 110,600 gallons of groundwater were re-injected to the subsurface during upgraded groundwater treatment system operation (Phase 1 and 2) under the remedy phase;
5. As of May 25, 2022, approximately 158 gallons of NAPL were recovered by the upgraded system during the remediation phase. NAPL was recovered by the groundwater treatment system and containerized in the knockout tank attached to the oil/water separator throughout treatment system operation. Recovered NAPL was transferred from the knockout tank to 55-gallon drums located on-site prior to off-site disposal. Additional details pertaining to investigation derived waste (IDW) and NAPL recovery and off-site disposal are included in the FER.
6. Disposal of remediation-derived non-hazardous waste generated during the installation and operation of the upgraded remediation system. Additional soil, water, and solid waste (PPE, absorbent socks, absorbent pads, and cleaning materials) were generated during injection and recovery well installation, treatment system operation, and system equipment maintenance and cleaning. These wastes were containerized in DOT-approved 55-gallon drums. The drums were sealed at the end of each workday and stored on-site prior to off-site disposal. Eighteen (18) 55-gallon drums containing non-hazardous solid waste from soil boring installation, well

installation and equipment cleaning activities and three (3) 55-gallon drums containing non-hazardous liquid waste from equipment cleaning activities were removed from the Site in 2021.

7. Approximately 7.11 tons of 3/8-inch virgin crushed stone meeting the requirements of 6 NYCRR Part 375-6.8(a) were imported to establish the design grades and backfill injection and recovery well trenching at the Site prior to installation/repair of the vapor barrier and concrete slab. Material proposed for import to the Site was approved by NYSDEC prior to import. Additional details pertaining to material import are included in the FER;
8. Construction and/or restoration of the Site cover system consisting of the existing concrete floor slab with underlying vapor barrier and newly poured concrete floor slab sections (associated with the trenching areas and the installation/repair of remedial components including a vapor barrier across the trenching areas for injection and recovery wells) to prevent human exposure to contaminated soil/fill remaining at the Site;
9. Execution and recording of an EE (included in Appendix A) to restrict land use and prevent future exposure to any contamination remaining at the Site;
10. Discharge of extracted groundwater following treatment under a NYCDEP discharge permit;
11. Maintenance and operation of the previously installed passive SSDS to prevent migration of vapors into the building; and
12. Development and implementation of this SMP for long term management of remaining contamination as required by the Environmental Easement, which includes plans for: (1) Institutional and Engineering Controls, (2) Monitoring, (3) Operation and Maintenance, and (4) Reporting.

2.9 Upgraded Groundwater Treatment System Specifications

The initial LNAPL recovery system was installed and operated at the Site prior to acceptance in the BCP. The BCP remedy phase upgrades were performed between March 2021 and July 2021, which included:

- Upgrading the existing extraction well fluid manifold for the recovery wells.
- Installation of new pneumatically-actuated pumps within the four recovery wells.
- Replacement of the existing air compressor to power the pumps within the recovery wells.
- Cleaning and maintenance of the existing oil/water separator and bag filter housing.
- Addition of a Bonifiber™ filter vessel.
- Replacement of granular activated carbon (GAC) within the existing 150-pound GAC vessel.
- Addition of a second 150-pound GAC vessel in series, installation of a 150-gallon plastic mixing tank for surfactant and oxygen infusion dosing via the injection well manifold.
- Installation of the injection well manifold, and installation of a programmable logic controller (PLC) with alarms and remote telemetry.

Additional modifications were made to the system to optimize treatment during Phase 1 and Phase 2 operations following system start up in July 2021. A second bag filter housing was added in December 2021 in series with the pre-existing bag filter housing to increase the lifetime of the Bonifiber™ and GAC filter vessels. Oxygen infusion equipment replaced the surfactant injection equipment upon transition from Phase 1 to Phase 2 of groundwater treatment activities in February 2022.

As of the date of this Revised SMP, the Phase 2 system operation remains active with all design components in operation, as described above.

2.10 Remediation System Operational Phases Completed During the Remedy

Phase 1 Groundwater Treatment:

Phase 1 of the in-situ groundwater treatment program was conducted using surfactant injection and recirculation over the approximately 13,000-square foot LNAPL treatment zones, located in the northeastern and northwestern portions of the Site basement. The vertical extent of the LNAPL treatment area was limited to the groundwater interface and the smear zone at depths of approximately 4 to 9 feet below the basement floor. Phase 1 treatment began in July 2021 with extraction of groundwater and re-injection of groundwater amended with a food-grade anionic surfactant with the TASK™ product, provided by Tersus Environmental of Wake Forest, North Carolina. The TASK™ surfactant product is an anionic surfactant and was injected in a dilute solution with extracted groundwater to five injection wells (IW-05, IW-07 through IW-10) located adjacent to or within the NAPL treatment areas. The TASK™ surfactant is biodegradable, ensuring that no residual surfactant will remain in the aquifer after remediation is completed. The surfactant was chosen for this Site because it does not create stable emulsions, which can be difficult to separate, and allowed for NAPL and water separation in the existing on-site oil/water separator. Sodium chloride was added to the surfactant solution prior to injection to increase hydrocarbon solubility.

Surfactants were injected in batches in a controlled manner over four separate surfactant injection events between July 2021 and December 2021. Each surfactant event included injection of a minimum of 2,200 gallons of treated groundwater dosed with surfactant and sodium chloride to the Phase 1 injection well network consisting of five injection wells. Surfactant amended groundwater was injected into the saturated zone at and within the overburden groundwater table at approximately 4 to 9 feet below basement grade. Following each surfactant injection event, the treatment and recovery system was operated approximately 30 additional days to recirculate and flush groundwater through the treatment zones towards the extraction wells before performing the next surfactant loading event. AKRF performed semi-monthly site inspections to confirm ongoing system operation and identify potential biofouling in the extraction well lines, monitoring well gauging to confirm the presence and thickness of LNAPL beneath the Site, and make system adjustments, as necessary, to prevent potential migration of the LNAPL plume. AKRF performed intermediate treatment performance groundwater and sub-slab soil gas monitoring following completion of surfactant injection event #2 in September 2021.

The injection of a minimum of approximately 85,000 gallons of treated groundwater and surfactant solutions was completed during the Phase 1 treatment program, equivalent to flushing 133% of the treatment area pore volume. Phase 1 treatment occurred between later June 2021 through Late January 2022. At the time of completion of Phase 1 treatment, , approximately 98,000 gallons of treated groundwater and surfactant solutions were injected into the subsurface from initiation of Phase 1 treatment and upgraded treatment system start up in July 2021 through January 31, 2022. Groundwater extraction was conducted for the entirety of the Phase 1 event, with a final Phase 1 treatment groundwater extraction volume of 230,000 gallons, or approximately three times the injected groundwater volume. The groundwater treatment system underwent upgrades and modifications in February and March 2022 in preparation for Phase 2 operation.

Phase 2 Groundwater Treatment:

Following the Phase 1 surfactant injection and LNAPL recovery operations, the treatment transitioned to Phase 2 operations and was expanded to include the southeastern portion of the Site, covering a larger area of approximately 23,150 square feet. The full injection well network was

utilized during the Phase 2 treatment, which extended 10 feet into the saturated zone. Surfactant injection equipment was removed from the treatment system and replaced with the oxygen infusion equipment. Oxygen, nutrient, and microbial amendments were added to the injected water during Phase 2 operations via the oxygen concentration and amendment holding tank. The blended microbial population contained a combination of aerobic and facultative anaerobic microorganisms that have the ability to break down a broad range of hydrocarbon compounds and assisted in the aerobic biodegradation of the remaining petroleum residuals.

Phase 2 of the in-situ groundwater treatment program was designed to address the shallow 1,2-DCA plume using bioremediation to promote the aerobic biodegradation/cometabolism of residual petroleum compounds and dissolved 1,2-DCA. While the focus of Phase 2 operations is on the treatment of dissolved phase chlorinated solvent contamination, recovery of any residual NAPL continued through operation of the extraction fluid pumps and oil/water separator.

The locations of the injection well and recovery well network that establishes the groundwater treatment areas and the monitoring well network are shown on Figure 10.

2.11 Performance Monitoring During the Remedy

Groundwater

Three groundwater monitoring events (September 2021, January 2022, and May 2022) were completed to monitor remediation performance with respect to the RAOs. Groundwater samples were collected from the network of Site monitoring wells in accordance with the NYSDEC RAWP and ISDD. A summary of the baseline groundwater sampling results are included in Tables 2A and 2B. A summary of the remedial action performance monitoring groundwater sampling results are included in Tables 3A and 3B, and Figure 12 shows compounds that were detected above the AWQS.

Petroleum VOCs Summary

Between one and four petroleum-related BTEX (benzene, toluene, ethylbenzene, and xylenes) compounds were detected in MW-01, MW-03R, MW-06, MW-07, MW-09, MW-23, and MW-24 during the September 2021, January 2022, and/or May 2022 sampling events. The concentration of benzene detected in MW-03R (1.5 µg/l in September 2021, 82 µg/l in January 2022), MW-07 (3.8 µg/l in January 2022 and 2.1 µg/l in May 2022), and MW-24 (99 µg/l in September 2021 and 82 µg/l in January 2022) exceeded the Class GA Ambient Water Quality Standard (AWQS) of 1 µg/l for this compound. The remaining BTEX compounds detected in the groundwater samples were below their respective AWQSs. Petroleum related compounds were detected at concentrations similar to or slightly lower than the three baseline sampling events performed prior to the beginning of the remedial action.

Solvent VOCs Summary

The following solvent-related VOC compounds were detected in one or more of the groundwater samples collected during the September 2021, January 2022, and May 2022 sampling events: 1,2-dichloroethane (DCA), 1,2-dichloropropane (DCP), cis-1,2-dichloroethene (DCE), acetone, chloroform, chlorobenzene, tetrachloroethene (PCE), and trichloroethene (TCE). 1,2-DCA was detected in MW-01, MW-03R, MW-04, MW-05, MW-06, MW-07, MW-16, MW-18, MW-22, MW-22D, MW-23, and MW-24 at concentrations ranging from an estimated value of 0.75 µg/l in MW-24 to 19,000 µg/l in MW-22D, above the AWQS of 0.6 µg/l for this compound. 1,2-DCP was detected in MW-04, MW-05, MW-18, and MW-22D at concentrations ranging from 1.3 µg/l in MW-05 to 1,000 µg/l in MW-22D, above the AWQS of 1 µg/l for this compound. TCE was detected

in MW-04, MW-05, MW-09, MW-10, MW-18, and MW-22D at concentrations ranging from an estimated value of 0.37 µg/l in MW-10 to 110 µg/l in MW-22D. The TCE detections of 6.8 µg/l (September 2021), 110 µg/l (January 2022), and 27 µg/l (May 2022) in monitoring well MW-22D exceeded the AWQS of 5 µg/l for this compound. Chlorobenzene was detected in MW-07 (4.2 µg/l, 8.3 µg/l, 7.2 µg/l) and MW-23 (5.1 µg/l, 2.5 µg/l, 5.4 µg/l), with the concentrations of 8.3 µg/l and 7.2 µg/l in MW-07 and 5.1 µg/l and 5.4 µg/l in MW-23 exceeding the AWQS of 5 µg/l. Chloroform was detected in MW-8, MW-20, and MW-22D at concentrations ranging from 8.7 µg/l in MW-22D to 22 µg/l in MW-20, exceeding the AWQS of 7.0 µg/l. Acetone was detected in MW-01, MW-06, MW-07, MW-10, MW-16 and MW-20 at concentrations ranging from 5.3 µg/l in MW-10 to 3,600 µg/l in MW-16, with detections at MW-01, MW-07, MW-16and MW-20 exceeding the AWQS of 50 µg/l. PCE was detected in MW-05, MW-07, MW-09, and MW-22D at concentrations ranging from an estimated value of 0.35 µg/l in MW-20 to 51 µg/l in MW-22D, with the detections at MW-22D exceeding the AWQS of 5 µg/l. Cis-1,2 DCE (MW-05, MW-09, MW-10, and MW-22D) was detected at concentrations below the AWQS of 5 µg/l. In general, solvent related compounds were detected at concentrations lower than or similar to the three baseline sampling events performed prior to the beginning of the remedial action.

1,2-DCA Summary

In September 2021, 1,2-DCA was detected at MW-22D at a concentration of 990 µg/l, which was higher than the concentrations detected in MW-04 (10 µg/l), MW-05 (24 µg/l), MW-18 (12 µg/l), MW-22 (4.4 µg/l), MW-23 (3.9 µg/l), and MW-24 (0.75 J µg/l).

In January 2022, 1,2-DCA was detected at MW-22D at a concentration of 19,000 µg/l, which was higher than the concentrations detected in MW-01 (120 µg/l), MW-03R (1.4 µg/l), MW-04 (2.8 µg/l), MW-05 (45 µg/l), MW-06 (120 µg/l), MW-07 (1.7 µg/l), MW-16 (120 µg/l), MW-18 (46 µg/l), MW-22 (5.0 µg/l), and MW-23 (1.8 µg/l).

In May 2022, 1,2-DCA was detected at MW-22D at a concentration of 2,700 µg/l, which was higher than the concentrations detected in MW-04 (6.0 µg/l), MW-05 (290 µg/l), MW-18 (1.1 µg/l), and MW-23 (2.8 µg/l).

This pattern is consistent with historical sampling results, where the concentrations of 1,2-DCA have historically been the highest in the area of MW-22D and surrounding wells MW-4, MW-18, and MW-22. The network of these wells is located on the southeastern and upgradient property boundary. The detections of 1,2-DCA in MW-22D in September 2021 and May 2022 sampling events were lower than or similar to the previous two baseline sampling events performed in September 2020 (1,200 µg/l) and January 2021 (4,200 µg/l). The overall reduction of 1,2-DCA concentrations is consistent with the RAOs set forth in the RAWP.

Sub-Slab Soil Gas

Two sub-slab soil gas monitoring events (September 2021 and May 2022) were completed during the remedy to confirm that operation of the remediation system was not resulting in a buildup of vapors beneath the building foundation. The solvent-related VOC detections for both events were lower than or similar to the RI sampling results, where a no further action was established, and indicate that the remedial activities have not affected the potential for soil vapor intrusion. Based on a review of historical sub-slab soil gas results, petroleum-related VOC detections in sub-slab soil gas in September 2021 and May 2022 were similar to or lower than the previous baseline sampling events (conducted in October 2018 and August 2019). A summary of the baseline sub-

slab soil gas sampling results are included in Table 4. A summary of the remedial action performance monitoring sub-slab soil gas results are included in Table 5.

The FER includes additional details pertaining to the remedial action performance monitoring sampling events.

2.12 Remaining Contamination

2.12.1 Soil

Soil quality was characterized during previous investigations prior to entering the BCP, and during the RI and PDI investigations conducted as part of the BCP. This section includes a summary of the remaining contamination in soil below the foundation slab and includes a description of the compounds that exceed the Soil Cleanup Objectives (SCOs) utilized for the BCP Track 4 cleanup, which were identified in the NYSDEC-approved RAWP as the Restricted Residential Site Cleanup Objectives (RRSCOs).

Petroleum Contamination

The previous investigations documented that petroleum contamination exists in two distinct LNAPL zones, with a small zone near MW-1 on the eastern side of the Site, and a larger zone in the area of MW-2, MW-3, MW-6, MW-16, MW-24, and MW-26 on the western side of the Site. The soil contamination in these zones was not observed as a distinct point source, but rather it was as a shallow smear zone created by the LNAPL moving vertically with groundwater table fluctuations. In the absence of NAPL, laboratory results confirmed that soil quality, including within the smear zone, including the detected concentration of VOCs and SVOCs, was below the RRSCOs.

Solvent Contamination

1,2-DCA was detected in soil sample SB-22D [collected during the RI at a depth of 14 to 15 feet below the basement level garage floor (approximately 22 feet below grade) and approximately 5 feet below the observed water table] at a concentration of 7.9 mg/kg, above the RRSCO of 3.1 mg/kg. No other VOCs were documented above RRSCOs.

Metals Contamination

Trivalent chromium was detected in soil sample RW-3_5-7_20200813 (collected from 5 to 7 feet below basement slab grade at the injection well IW-02) at a concentration of 231 mg/kg, above its RRSCO of 180 mg/kg. Trivalent chromium was also detected in the duplicate soil sample from the same boring (RW-X_5-7_20200813) at a concentration of 251 mg/kg, above the RRSCO of 180 mg/kg. There is no evidence that the trivalent chromium is associated with a release of contamination and is assumed to be associated with historical fill at the Site. No other metals compounds were detected above their RRSCOs.

Analytical results for all soil samples remaining at the Site after the completion of the Remedial Action that exceed the RRSCOs are identified in In-Text Table 4 below. Figure 11 shows the sampling location of all soil samples at the Site that exceed the RRSCOs.

In-Text Table 4
Remaining Soil Contamination Summary

AKRF Sample ID			SB-22D_14-15_20181026	RW-3_5-7_20200813	RW-X_5-7_20200813
Laboratory Sample ID			460-167813-1	460-216044-1	460-216044-2
Date Sampled			10/26/2018	8/13/2020	8/13/2020
Dilution Factor			50	1	1
Unit			mg/kg	mg/kg	mg/kg
Compound	NYSDEC UUSCO	NYSDEC RRSCO			
1,2-Dichloroethane	**0.02**	**3.10**	**7.9**	NS	NS
Chromium, Trivalent	**30**	**180**	NS	**231**	**251**

Notes:
Exceedances of Part 375 Unrestricted Use Soil Cleanup Objectives are highlighted in bold font.
Exceedances of Restricted Residential Soil Cleanup Objectives (RRSCOs) are highlighted in gray.
mg/kg - milligrams per kilograms

PCBs and Pesticides

PCBs and pesticides were either not detected in soil samples or were not present above their RRSCOs.

Emerging Contaminants

Fourteen of the 21 PFAS compounds were detected in one or more soil samples at concentrations ranging from an estimated 0.017 ppb to 0.12 ppb. Two PFAS compounds that were detected in the soil samples were also detected at similar concentrations in the laboratory method blank and are not considered to be related to site conditions.

1,4-Dioxane was not detected in the soil samples. Concentrations of emerging contaminants that were detected at the Site remained within typical background ranges.

2.12.2 Groundwater

Laboratory results for the performance monitoring sampling events completed in September 2021, January 2022, and May 2022 (prior to COC issuance) are included in Tables 3A and 3B, Figure 12 shows compounds that were detected above the AWQS, and a summary of the results is included below.

The solvent-related VOC 1,2-DCA was detected in up to 12 monitoring wells at concentrations ranging from (0.75 J µg/l to 19,000 µg/l) throughout performance monitoring during the remedy, which are above the AWQS of 0.6 µg/l. The concentrations of 1,2-DCA in MW-4, MW-18, and MW-22, which was historically an order of magnitude higher than the remaining and are located in close proximity to the suspected source area, was similar to or lower compared to the baseline sampling results, indicating that the Phase 1 and 2 remediation efforts have shown a positive effect on groundwater quality with respect to the RAOs.

Additional solvent-related VOCs, including acetone, PCE, TCE, 1,2-DCP, chlorobenzene, and chloroform were present at a lesser extent, with concentrations exceeding the NYSDEC AWQS in up to five monitoring wells throughout performance monitoring during the remedy. Concentrations of these compounds were similar to or lower compared to the baseline sampling results indicating that the Phase 1 and 2 remediation efforts have shown a positive effect on groundwater quality with respect to the RAOs.

Petroleum-related VOCs including toluene and ethylbenzene were present in concentrations below NYSDEC AWQS during remedial performance groundwater sampling. The concentration of petroleum-related VOC, benzene, was detected at concentrations ranging from 1.5 µg/l to 99 µg/l, exceeding the AWQS of 1 µg/l for this compound. Petroleum related compounds were detected at concentrations similar to or lower than the three baseline sampling events performed prior to the remedial action

indicating that the Phase 1 and 2 remediation efforts have shown a positive effect on groundwater quality with respect to the RAOs.

Groundwater quality documented throughout each monitoring period of Site Management, including a review of the continued system performance, will be documented in the annual PRR reports.

2.12.3 Sub-Slab Soil Vapor

Laboratory results for the performance monitoring sub-slab soil vapor sampling events completed in September 2021 and May 2022 are included in Table 5 and shown on Figure 13.

There were no petroleum- or solvent-related VOC contamination hot spots detected in sub-slab soil vapor during the soil vapor monitoring program performed during the performance monitoring remedial action phase in September 2021 and May 2022. Sub-slab soil vapor results were similar to the baseline sampling events indicating that the remedial action did not affect sub-slab soil vapor concentrations. Isolated areas of TCE and 1,2-DCA existed in sub-slab soil vapor at low concentrations where, combined with the existing vapor barrier, passive sub-slab venting system, and cellar air exchange, additional monitoring is not necessary.

2.13 Management of Remaining Contamination

Site contamination was addressed using the NYSDEC-approved Track 4 Restricted Residential Use cleanup remedy, as described in the RAWP, ISDD, and DD, which included the utilization of ICs and ECs to isolate the remaining contamination, prevent exposure, and be protective of human health and the environment. The IC is in the form of an EE for the Site that requires periodic certification, allows the use and development of the Site for restricted residential use, restricts the use of groundwater as a source of potable or process water without necessary water quality treatment as determined by NYSDOH, and requires compliance with this Department-approved SMP.

The following Section 3.0 (Institutional and Engineering Control Plan) includes descriptions and plans for the ECs, and the requirements for monitoring, inspection, operation and maintenance, and reporting to confirm that remediation goal continue to be met.

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN

3.1 General

Since remaining contaminated soil and groundwater exist at the Site, ICs and ECs are required to protect human health and the environment. This IC/EC Plan describes the procedures for the implementation and management of all IC/ECs at the Site. The IC/EC Plan is one component of the SMP and is subject to revision by NYSDEC.

This plan provides:

- A description of all ICs/ECs on the Site;
- The basic implementation and intended role of each IC/EC;
- A description of the key components of the ICs set forth in the EE;
- A description of the controls to be evaluated during each required inspection and periodic review;
- A description of plans and procedures to be followed for implementation of ICs/ECs, such as the implementation of the EWP (provided in Appendix C) for the proper handling of remaining contamination that may be disturbed during maintenance or redevelopment work on the Site; and
- Any other provisions necessary to identify or establish methods for implementing the ICs/ECs required by the Site remedy, as determined by NYSDEC.

3.2 Institutional Controls

A series of ICs is required by the RAWP to: (1) implement, maintain, and monitor EC systems; (2) prevent future exposure to remaining contamination; and (3) limit the use and development of the Site to Restricted Residential uses only. Adherence to these ICs on the Site is required by the EE and will be implemented under this SMP. ICs identified in the EE may not be discontinued without an amendment to or extinguishment of the EE. The IC boundaries are shown on Figure 2.

The ICs are as follows:

- The Site may be used only for restricted residential use;
- All ECs must be operated and maintained as specified in this SMP;
- All ECs on the Site must be inspected and certified at a frequency and in a manner defined in this SMP;
- The use of groundwater underlying the Site is prohibited without necessary water quality treatment as determined by NYSDOH or the New York City Department of Health and Mental Hygiene (NYCDOHMH) to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from NYSDEC;
- Groundwater and other environmental or public health monitoring must be performed as defined in this SMP;
- Data and information pertinent to Site management must be reported at the frequency and in a manner as defined in this SMP;
- All future activities that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in this SMP;

- Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in this SMP;
- Access to the Site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the EE;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on Figure 2, and any potential impacts that are identified must be monitored or mitigated; and
- Vegetable gardens and farming on the Site are prohibited.

3.3 Engineering Controls

3.3.1 Site Cover System

Exposure to remaining contamination in soil and groundwater beneath the Site is being prevented by a cover system placed over the Site. The site cover system includes a minimum of 6 inches of concrete building slab underlain by a vapor barrier, and concrete or asphalt paving in all exterior areas, including the exterior courtyard and surface parking lot. The Site cover system complies with the requirements stated in Section 12.3 of the RAWP. The cover system installed at the Site is comprised of:

- The pre-existing minimum 6-inch concrete floor slab (up to 12 inches at some locations) underlain by a minimum 20-mil vapor barrier in all areas of the basement including the construction areas for the SSDS components and trenching for extraction and injection wells;
- The minimum 6-inch concrete slab over all SSDS branch locations that are underlain by a minimum of 18 inches of 1.5-inch clean stone surrounding the installed SSDS pit structure and the installed Grace Preprufe 300R® vapor barrier;
- The minimum 6-inch concrete slab over all trenches associated with the extraction and injection well locations that are underlain by Grace Bituthene® 4000 and Grace Bituthene® liquid membrane vapor barrier followed by a minimum of 2 inches of clean stone encompassing the installed extraction and injection well connections, conveyance piping, and tubing;
- The minimum 6-inch concrete pavement installed on the exterior, surface-level parking lot; and
- The 6-inch concrete pavement in an approximately 20-foot by 50-foot area in the southeastern corner of the Site not covered by the building slab.

The integrity of the Site cover system will be maintained at all times. The EWP provided as Appendix C outlines the procedures required to be implemented in the event the cover system is breached, penetrated, or temporarily removed, and any underlying remaining contamination is disturbed. Procedures for the inspection of this cover are provided in the Monitoring and Sampling Plan included in Section 4.0 of this SMP. Any work conducted pursuant to the EWP must also be conducted in accordance with the procedures defined in the HASP and CAMP provided in Appendix D. The Site Cover System Plan is provided as Figure 14. Any disturbance of the site's cover system must be overseen by a qualified environmental professional as defined in 6 NYCRR Part 375, a Professional Engineer (PE) who is licensed and registered in New York State, or a qualified person who directly reports to a PE who is licensed and registered in New York State.

3.3.2 Groundwater Treatment System

Exposure to remaining contamination in groundwater beneath the Site is being prevented by the Site cap and the IC that prevents use of groundwater for potable purposes. The remaining contamination is being managed by the groundwater treatment system installed in the basement-level of the building. Remediation of the residual groundwater contamination will be performed through operation of the groundwater treatment system in the Site Management phase. The treatment areas will continue to be remediated using groundwater extraction, amendment, and reinjection to create a circulation cell within the treatment area. The groundwater treatment system complies with the requirements stated in Section 12.1 of the RAWP. The groundwater treatment system installed at the Site is comprised of:

Groundwater Recovery Equipment

- Four extraction wells are equipped with a pneumatically actuated Auto Pump (AP) provided by QED Environmental Systems. All extraction wells are equipped with top-loading pumps to maximize LNAPL recovery. A detail figure of the extraction wells and their construction is provided in Figure 16A.
- The groundwater recovery pumps are powered by an air compressor installed the basement treatment room. The total air flow rate to power the extraction pump network is approximately 2.0 cubic feet per minute at a maximum pressure of 40 pounds per square inch (psi). The compressor has an incorporated holding tank to store compressed air and reduce the compressor run time.
- An air distribution manifold is installed within the basement treatment room to direct air flow to each extraction pump. The manifold includes a pressure gauge and moisture and oil filter on the header. Each extraction well has an independent branch on the manifold, equipped with a pressure regulator and pressure gauge, and is connected to a 0.5-inch diameter air injection line. A schematic depicting the air distribution manifold is provided on Figure 16B.
- The extracted groundwater is conveyed to the basement treatment room in dedicated 1-inch diameter hoses. The hoses are plumbed to an extraction well manifold installed within the basement treatment room. Each line is equipped with a pressure gauge, control valve, check valve and a flow totalizer. The header line on the manifold is equipped with a pressure gauge. A detail of the extracted water manifold is provided on Figure 16B.

Groundwater Treatment Equipment

- The extracted groundwater flows into an oil/water separator (OWS) with an approximately 300-gallon capacity, including an approximately 50-gallon clean water chamber. Extracted LNAPL is separated in the coalescing media within the OWS and is allowed to float of the top of the water surface. A slotted lateral pipe allows the separated LNAPL to flow via gravity to a 55-gallon LNAPL holding tank. The OWS is equipped with secondary containment to capture any leaks if punctured or it overflows.
- The LNAPL holding tank is equipped with a high-level switch that will shut off the compressor, preventing additional groundwater and LNAPL extraction until the holding tank is emptied. A secondary containment stand is placed under the LNAPL holding tank to contain any leaks from the holding tank if it becomes compromised.

- Accumulated groundwater in the OWS clean water chamber is periodically pumped out with the existing centrifugal transfer pump when the high level point is triggered to cycle groundwater entering the OWS from the extraction well pumps. The pump is controlled by an infrared level sensor that can detect the distance to the top of the water surface.
- The extracted groundwater is pumped through two bag filters in series for particulate removal. The bag filter housings are approximately 4 inches in diameter and 3 feet long. A 25 to 35-micron bag filter is used within the first bag filter and a 10-micron bag filter is used within the second bag filter to remove entrapped sediment within the bag filters. Pressure gauges are installed before and after the bag filters to monitor pressure drop across the filters.
- A Bonifibers™ filter is located after the bag filters to remove any additional LNAPL that passed through the OWS.
- The extracted groundwater then flows through two 150-pound granular activated carbon (GAC) filters plumbed in series for the final treatment step. These GAC filters remove residual dissolved phase VOCs and SVOC compounds and achieve the requirements of the sanitary sewer discharge permit.

Groundwater Disposal

- The majority of treated groundwater flowing from the second GAC filter, exclusive of the portion being reinjected, is routed to the sanitary sewer discharge point connection. A flow totalizer and control valve are installed prior to the discharge point to record and control the proportion of treated groundwater flowing to the sanitary sewer discharge. The discharge permit from the NYCDEP is renewed annually.

Groundwater Reinjection

- The remaining treated groundwater (15% to up to 50% of the total flow rate) flows to a 150-gallon plastic mixing tank where remediation amendments are added prior to reinjection.
- A flow totalizer is installed on the reinjection line to track the volume of treated water re-injected back into the system.
- The Phase 1 (LNAPL recovery) injections were performed between July 2021 and January 2022 and included the addition of the anionic TASK™ surfactant product to the treated groundwater. The surfactant was stored in a separate 55-gallon drum and was added to the mixing tank using a dosing pump. The dosing pump was integrated with the reinjection flow totalizer to maintain a constant dosing rate. Sodium chloride was added along with the surfactant as an amendment during Phase 1 injections
- Phase 2 (aerobic bioremediation) injections were initiated in March 2022 and include dosing the treated groundwater with oxygen. The addition of oxygen was accomplished using an infusion system provided by Prosper Environmental of Miami, Florida. The infuser was installed in the mixing tank to introduce oxygen into the treated groundwater to achieve dissolved concentrations up to approximately 40 milligrams per liter (mg/L).
- Oxygen is provided using an air compressor and Topaz Ultra oxygen generator. The Topaz oxygen generator separates oxygen from the air provided by the compressor and releases the unused nitrogen back into the ambient atmosphere.

- Nutrients and microbes are periodically added during the Phase 2 program in accordance with the NYSDEC-approved ISDD.
- A transfer pump was installed at the base of the amendment loading tank and is controlled by high and low level switches. The transfer pump conveys the treated and amended groundwater to an injection manifold. A high-high level switch was installed to stop groundwater extraction in the event that water levels become too high in the 150-gallon plastic mixing tank.
- The injection manifold is equipped with a pressure gauge and independent branches for each injection well. Each branch contains an independent pressure gauge, control valve and flow totalizer. A detail of the injected water manifold is provided on Figure 16B.

Treatment System Controls

- The treatment system is controlled with a programmable logic controller (PLC). The PLC interlocks the air compressor (C-1) (which powers the extraction well pumps and oxygen infuser), and transfer pumps to prevent water movement in the event of an alarm condition.
- The treatment system is equipped with telemetric capabilities to allow for remote inspection and status checks. The telemetry system reports any alarm conditions and notifies AKRF personnel when the system shuts down.
- The extracted water and injected water totalizers are connected to the PLC and telemetry system to allow for remote monitoring of overall injection performance.

The remedy was conducted in two phases to remove LNAPL (Phase 1) and remediate dissolved 1,2-DCA and residual petroleum compounds (Phase 2). The treatment was implemented using a groundwater extraction and reinjection strategy to flush the aquifer with surfactants and oxygenated water. The surfactant flushing was conducted in Phase 1 to remove LNAPL present in the northeastern and northwestern portions of the Site. Phase 2 operations began after Phase 1 in March 2022 and injected oxygenated water over a larger area to promote the aerobic biodegradation/co-metabolism of residual petroleum compounds and dissolved 1,2-DCA.

During Site management, the groundwater treatment system will continue to operate, in Phase 2, on a continual basis, 24 hours a day, 7 days a week, and 365 days a year until monitoring (as outlined in Section 5 of this SMP) and appropriate consultation with NYSDEC and NYSDOH confirm that the groundwater treatment system is no longer required to treat petroleum and solvent contaminated groundwater at the Site. The location and components of the groundwater treatment system are shown on the Process and Instrumentation Diagram on Figure 17.

Procedures for operating and maintaining the groundwater treatment system are documented in the Operation and Maintenance Plan (Section 4 of this SMP). Procedures for monitoring the groundwater treatment are included in the Monitoring Plan (Section 5 of this SMP). The Monitoring Plan also addresses the need for action following experience of severe conditions which may affect controls at the Site.

3.3.3 Response Procedures

In the event of an emergency, the fire department and other emergency response groups will be notified immediately by telephone. The emergency telephone number list provided

in the contingency plan in Section 5.4. The list will also be posted prominently at the Site and made readily available to all personnel at all times.

3.3.3.1. Procedure for Disturbance of Site Cover System

Prior to any planned disturbance of the site cover system, the location of existing monitoring points, groundwater monitor wells, and other EC elements within or beneath the concrete floor slab including SSDS branches, SSDS piping, and the injection and extraction well network will be identified using Figures 15, 16A, 16B, and 17. The following procedures will be required if the site cover system is accidentally disturbed, is required as part of a planned building improvement/repair, or if damage to the site cover system is discovered during a monitoring/inspection event:

- Notification of NYSDEC in accordance with applicable guidance outlined in Section 1.4 and the Excavation Work Plan (Appendix C) of this SMP;
- Submittal of a written plan detailing the disturbance location and proposed repair or replacement activities to return the cover system or associated underlying components to the appropriate operating condition;
- Performance of the planned disturbance in accordance with the Excavation Work Plan included as Appendix C; and
- Scheduling of a follow-up inspection to be performed under the direct oversight of a qualified environmental professional.

The appropriate actions for other on-Site emergencies are detailed in the attached HASP and CAMP, provided in Appendix D. The HASP may require revisions as necessitated by changes to Site conditions and project personnel. The plan will be updated as necessary or at a minimum of once every five years to ensure accuracy. Procedures associated with alarm systems established to monitor the operation of the groundwater treatment system are described in Sections 4 and 5 of this SMP.

3.3.4 Criteria for Completion of Remediation/Termination of Remedial Systems

Generally, remedial processes are considered completed when effectiveness monitoring indicates that the remedy has achieved the remedial action objectives identified by the decision document. The framework for determining when remedial processes are complete is provided in Section 6.6 of NYSDEC DER-10. Unless waived by the NYSDEC, confirmation samples of applicable environmental media are required before terminating any remedial actions at the site. Confirmation samples require Category B deliverables and a Data Usability Summary Report (DUSR).

As discussed below, the NYSDEC may approve termination of a groundwater monitoring program. When a remedial party receives this approval, the remedial party will decommission all site-related monitoring, injection and recovery wells as per the NYSDEC CP-43 policy.

The remedial party will also conduct any needed site restoration activities, such as asphalt patching and decommissioning treatment system equipment. In addition, the remedial party will conduct any necessary restoration of vegetation coverage, trees and wetlands, and will comply with NYSDEC and United States Army Corps of Engineers regulations and guidance. Also, the remedial party will ensure that no ongoing erosion is occurring on the Site.

3.3.4.1. Site Cover System

The site cover system is a permanent control and the quality and integrity of this system will be inspected at defined, regular intervals in perpetuity as outlined in Section 4.2 of this SMP.

3.3.4.2. Groundwater Treatment System Operation and Groundwater Monitoring

The groundwater treatment system will continue to operate under the Site Management phase. Groundwater monitoring activities to assess the effectiveness of the remedy will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC AWQS or have become asymptotic at an acceptable level over an extended period. Once this occurs, the continuous operation of the groundwater treatment system will be re-evaluated.

Groundwater monitoring will continue (in accordance with Section 4.3 of this SMP) until permission to discontinue or reduce monitoring is granted in writing by the NYSDEC. If groundwater contaminant levels identified during the implementation of the Sampling and Monitoring Plan become asymptotic at a level that is not acceptable to the NYSDEC, groundwater treatment will continue to be implemented and/or other control/treatment measures will be evaluated.

4.0 MONITORING AND SAMPLING PLAN

4.1 Introduction

4.1.1 General

This Monitoring and Sampling Plan describes the measures for evaluating the overall performance and effectiveness of the remedy. This Monitoring and Sampling Plan may only be revised with the approval of NYSDEC. Details regarding the sampling procedures, data quality usability objectives, analytical methods, etc. for all samples collected as part of site management for the Site are included in the Quality Assurance Project Plan (QAPP) provided in Appendix E.

4.1.2 Purpose and Schedule

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

- Sampling and analysis of all appropriate media (e.g. groundwater);
- Assessing compliance with applicable NYSDEC standards, criteria and guidance (SCGs), particularly Restricted Residential SCOs for soil and NYSDEC Ambient Groundwater Quality Standards (AWQS);
- Assessing achievement of the remedial performance criteria;
- Evaluating Site information periodically to confirm that the remedy continues to be effective in protecting public health and the environment; and
- Preparing the necessary reports for the various monitoring activities.

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

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

Reporting requirements are provided in Section 7.0 of this SMP. Monitoring the performance of the remedy and overall reduction in contamination on-site will be conducted for the periods specified for each matrix listed in In-Text Table 5. The frequency thereafter will be determined in consultation with NYSDEC and based on reports submitted showing contaminant trends. Trends in contaminant levels in groundwater in the affected areas will be evaluated to determine if the remedy continues to be effective in achieving remedial goals. Monitoring programs are summarized in In-Text Table 5 and outlined in detail in Sections 4.2 and 4.3 below.

In-Text Table 5
Monitoring/Inspection Schedule

Monitoring Program	Frequency*	Location	Matrix	Analysis
Site Cover System	Annually	Exterior paved areas and basement	Cover System Integrity	Visual Inspection of Conditions
Groundwater Gauging	Quarterly	Accessible on and off-site monitoring wells	Groundwater	Water Level
Groundwater Treatment System	Monthly	Basement treatment room, injection and extraction well network	Groundwater	Visual Inspection, Field Measurements
Groundwater Treatment System Status	Continuous with Remote Telemetry and Email Notification	Basement equipment room and antenna to garage door	System Status (on/off) and other Alarm Conditions	Alarm Limits for Flow Rates, High and Low Levels for Water and Pressure
Groundwater Monitoring and Sampling	Quarterly	Selected on-Site and off-Site well network without measurable LNAPL	Groundwater	VOCs by EPA Method 8260
	Annually	Selected on-Site and off-Site well network without measurable LNAPL	Groundwater	VOCs by EPA Method 8260

Notes:
*The frequency of events will be conducted as specified until otherwise approved by NYSDEC and NYSDOH.
VOCs – Volatile Organic Compounds
SVOCs – Semivolatile Organic Compounds

4.2 Cover System Monitoring

Exposure to residual contaminated soil and groundwater remaining at the Site is being prevented by an engineered site cover system that is made up of the pre-existing concrete floor slab underlain by a vapor barrier and the newly constructed concrete floor slab underlain by a vapor barrier overlying the installation areas for the SSDS components and trenching for injection wells, and concrete or asphalt paving in all exterior areas including the exterior courtyard and surface parking lot. The location and details of the site cover system are shown on Figure 14.

The site cover system will remain intact 24-hours a day, 7 days a week, for 365 days a year. Disturbance of the site cover system or EC components is prohibited by the Environmental Easement. In the unlikely event of an unanticipated accidental or required disturbance of the site cover system, the response procedure is outlined in Section 3.3.5.1.

Monitoring of the site cover system will occur on an annual basis as long as the Environmental Easement is in effect to ensure the system's integrity. Monitoring will consist of visual inspection, which shall evaluate the structural integrity of the concrete floor slab of the basement and exterior paved areas, support columns into the floors and the wall joints. If any cracks or openings are identified, they shall be screened for organic vapors with a PID and any readings shall be noted. In

addition, any cracks or openings in the floor shall then be properly sealed or repaired. The results of the inspection will be included in the Periodic Review Report. In addition, the site cover system must be inspected and certified any time a disturbance in the system occurs. The inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the site cover system has been reported or an emergency occurs that is deemed likely to affect the operation of the system.

4.3 Media Monitoring Program

4.3.1 Groundwater Monitoring

The Site includes a network of thirteen (13) monitoring wells in the basement parking garage, and twelve (12) monitoring wells in sidewalk areas adjacent to and nearby the Site. Groundwater monitoring has been performed on a quarterly or semi-annual basis at the Site since 2010. The location of all monitoring wells, including injection wells and recovery wells, are shown on Figure 10. Sampling has typically included the basement area wells, with some or all of the exterior wells being included based on the specific sampling goals. Groundwater monitoring will be performed on a frequency approved by NYSDEC/NYSDOH to assess the performance of the remedy.

The network of groundwater monitoring wells selected for inclusion at the start of Site Management included up-gradient, plume area(s), and down-gradient locations to confirm overburden groundwater conditions at the Site. One groundwater monitor well, MW-22D, was also installed within the deeper aquifer screened from 30 to 35 feet below basement grade to monitor the potential for vertical migration of chlorinated VOCs. On-Site and off-Site monitoring wells were selected for Site Management based on sampling history and location within the plume to provide the data needed for remedial performance monitoring. In a letter dated September 9, 2024, NYSDEC approved the termination of MW-08, MW-09, and MW-21 from the groundwater sampling program. In an email dated May 1, 2026, NYSDEC approved the termination of MW-07 and MW-16 from the groundwater monitoring program. In addition, groundwater sampling and analysis for MW-03R, MW-04, MW-05, MW-10, and MW-18 were reduced from quarterly to semi-annual, and MW-01, MW-23, MW-24, and MW-26 were reduced from quarterly to annual. Lastly, analysis for SVOC by EPA Method 8270E was discontinued for all on-Site monitoring wells. Monitoring wells approved for permanent removal from the monitoring program will be abandoned in accordance with CP-43 Groundwater Monitoring Well Decommissioning Policy. The selected wells (as revised following NYSDEC approval) are summarized in In-Text Table 6:

In-Text Table 6
Monitoring Well Selected for Site Management Groundwater Sampling

Well Type	Well IDs
Quarterly Plume Area Monitoring Wells	MW-02, MW-22, MW-22D,
Semi-Annual Plume Area Monitoring Wells	MW-03R, MW-04, MW-05, and MW-18
Semi-Annual Exterior Control Points	MW-10 (Downgradient)
Annual Monitoring Wells*	MW-01, MW-06, MW-20, MW-23, MW-24, and MW-26
Discontinued Monitoring Wells	MW-07 and MW-16
Wells Slated for Decommissioning	MW-03, MW-07, MW-12, MW-14, MW-15, MW-16, MW-17, and MW-19

* These are wells added in addition to quarterly/semi-annual monitoring wells/control points.

The network of monitoring wells within the Site building and the adjacent sidewalk along North 11th Street, Berry Street, and North 12th Street have been selected based on the following criteria:

- Findings associated with the previous investigations and the Remedial Investigation including the history of detected compounds at each well, the monitoring well locations with respect to the petroleum and solvent source areas, the petroleum and solvent plume areas, and a north-northeast inferred groundwater flow direction in the overburden groundwater aquifer;
- Monitoring the deeper groundwater aquifer in 1,2-DCA source area; and
- The ability for the laboratory results for the selected monitoring wells to confirm that the RAOs for the Site have been met.

The locations of the monitoring wells selected for Site Management are highlighted on Figure 18.

Groundwater monitoring will continue as determined in consultation with NYSDEC and NYSDOH until residual groundwater concentrations are found to be below NYSDEC standards or have become asymptotic over an extended period, as shown in In-Text Table 5: Monitoring/Inspection Schedule in Section 4.1.2 of this SMP. Deliverables for the groundwater monitoring program are specified below. The groundwater monitoring program will include gauging from all accessible monitoring wells on a quarterly basis to confirm groundwater flow elevations and inferred groundwater flow direction in the overburden aquifer.

4.3.1.1. Groundwater Sampling Protocol

All monitoring well sampling activities will be recorded by taking applicable notes in a field book and by collecting the readings listed on the groundwater sampling field log presented in Appendix F. Pertinent observations or Site conditions at the time of the sampling (e.g., well integrity, etc.) will also be noted on the well sampling log. One well sampling log will be filled out for each of the wells sampled and serve as the inspection form associated with the groundwater monitoring well network.

Groundwater samples will be collected using low flow sampling techniques as described in U.S. EPA's Ground-Water Sampling Guidelines for the collection of groundwater samples from monitoring wells. Sampling will be conducted according to the following

procedures, and as detailed in the Quality Assurance Project Plan (QAPP) included as Appendix E:

- Slowly remove the access manhole and locking cap and immediately measure the vapor concentrations in the well with a PID calibrated to the manufacturer's specifications;
- Measure the depth to water and total well depth of all accessible monitoring wells prior to conducting any purging, and check for the presence of NAPL using an oil/water interface probe. Measure the thickness of NAPL, if any, and record in field book and the well sampling field log. Groundwater samples will not be collected from wells containing measurable NAPL;
- Use the water level and total well depth measurements to calculate the length of the mid-point of the water column within the screened interval. For example, for a well where the total depth is 30 feet, screened interval is 20 to 30 feet, and depth to water is 24 feet, the mid-point of the water column within the screened interval would be 27 feet.
- For all wells requiring sampling under the approved monitoring program, connect dedicated tubing to either a submersible bladder pump or peristaltic pump and lower the pump such that the intake of the pump is set at the mid-point of the water column within the screened interval of the well. Peristaltic pumps will be the preferred sampling pump since the existing recovery well pumps restrict well screen access, and to maintain consistency with groundwater sampling procedures followed during the RI and RA phases. Connect the discharge end of the tubing to the flow-through cell of a YSI multi-parameter (or equivalent) meter. Connect tubing to the output of the cell and place the discharge end of the tubing into a 5-gallon bucket. Since each on-site NAPL recovery well or injection well requires purging with a peristaltic pump (due to the remediation system pumping equipment within the well), and the existing 1-inch wells have a limited diameter for access, and a peristaltic has been used for all previous sampling events, AKRF recommends purging each well with a peristaltic pump for consistency. The peristaltic pump will allow for sample collection without the need for high density bladders when analyzing for emerging contaminants and minimize the potential for tainting the samples during collection.
- Activate the applicable pump at the lowest flow rate setting of the pump.
- Measure the depth to water within the well. The pump flow rate may be increased such that the water level measurements do not change by more than 0.3 feet as compared to the initial static reading. The well-purging rate should be adjusted so as to produce a smooth, constant (laminar) flow rate and so as not to produce excessive turbulence in the well. The expected targeted purge rate will be approximately 0.5 liters/minute and will be no greater than 3.8 liters/minute.
- Transfer discharged water from the 5-gallon buckets to LNAPL remediation system.
- During purging, collect periodic samples and analyze for water quality indicators [e.g., turbidity, pH, temperature, dissolved oxygen (DO), reduction-oxidation potential (ORP), and specific conductivity] with measurements collected approximately every five minutes.
- Continue purging the well until turbidity is less than 50 NTU and water quality indicators have stabilized to the extent practicable. The criteria for stabilization will

be three successive readings for the following low-flow groundwater stabilization parameters and criteria:

Parameter	Stabilization Criteria
PH	+/- 0.1 pH units
Specific Conductance	+/- 3% mS/cm
ORP/Eh	+/- 10mV
Turbidity	<50 NTU
Dissolved Oxygen	+/- 0.3 mg/l

Notes: mS/cm = millisievert per centimeter
mV = millivolts
NTU = nephthalometric turbidity units
mg/l = milligrams per liter

- If the water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, purging may be discontinued. Efforts to stabilize the water quality for the well must be recorded in the field book, and samples may then be collected as described herein.
- After purging, disconnect the tubing to the inlet of the flow-through cell. Collect groundwater samples directly from the discharge end of the tubing and place into the required sample containers as described in Section 4.4 of the QAPP. Label the containers as described in Section 4.6.1.1 of the QAPP and place in a chilled cooler.
- Collect one final field sample and analyze for turbidity and water quality parameters (pH, temperature, dissolved oxygen, reduction-oxidation potential, and specific conductivity).
- Once sampling is complete, remove the pump and/or tubing from the well. Dispose of the sample tubing and any associated PPE used for sampling in a 55-gallon drum designated for disposable sampling materials and PPE. The purge water will be managed as described in Section 3.4 of the QAPP included as Appendix E.
- Decontaminate the pump, oil/water interface probe, and flow-through cell, as described in Section 3.3 of the QAPP included as Appendix E.
- Record all measurements (depth to water, depth to NAPL, water quality parameters, turbidity), calculations (well volume), and observations in the project field book and the well sampling field log included as Appendix F.
- These groundwater well sampling procedures will be adjusted to adhere to the NYSDEC guidance on sampling for emerging contaminants, as needed.

4.3.2 Monitoring Well Repairs, Replacement and Decommissioning

If biofouling or silt accumulation occurs in the on-site and/or off-site monitoring wells, the wells will be physically agitated/surged and redeveloped in accordance with the details outlined in Section 3.2 of the QAPP included as Appendix E. Additionally, monitoring wells will be properly decommissioned and replaced, as necessary, (as per the requirements of this Monitoring Plan), if an event renders the wells unusable.

Repairs and/or replacement of wells in the monitoring well network will be performed based on assessments of structural integrity and overall performance.

The NYSDEC will be notified prior to any repair or decommissioning of monitoring wells for the purpose of replacement, and the repair or decommissioning and replacement process will be documented in the subsequent Periodic Review Report. Well

decommissioning without replacement will be done only with the prior approval of NYSDEC. Well abandonment will be performed in accordance with NYSDEC's CP-43: Groundwater Monitoring Well Decommissioning Policy. Monitoring wells that are decommissioned because they have been rendered unusable will be reinstalled in the nearest available location, unless otherwise approved by the NYSDEC.

4.4 Groundwater Treatment Inspections

The operation of the groundwater treatment system components will be confirmed by inspections to be performed by appropriate personnel. The environmental consultant under the direction of the Remedial Engineer will conduct detailed groundwater treatment system operations checks for the first year after issuance of the COC. The inspections will consist of visual inspection of treatment system manifolds and piping connections, individual extraction well pressure gauge and totalizer readings, individual and total injection well pressure and totalizer gauge readings, treatment component inspections and pressure gauge readings, bag filter inspections and change outs, groundwater amendment mixing tank inspection, air compressor pressure and oil gauges readings, NAPL knockout tank measurements, alarm checks, and sewer discharge totalizer readings. Monitoring associated with the performance of the groundwater treatment system is an integral portion of EC performance monitoring as described in further detail in Section 5.3 of this SMP.

As an added measure in addition to this schedule of inspection events, the alarm system associated with the groundwater treatment system is equipped with an internet connection, which will send an automatic notification to a designated contact list in the event of component/system alarm condition at the Site.

The inspection frequency outlined above and listed in In-Text Table 5 may be modified based on ongoing system operation and maintenance with the approval of NYSDEC. This SMP will be modified, as necessary, to reflect changes in monitoring and sampling plans approved by NYSDEC.

4.5 Site-Wide Inspection

Inspections of the Site cover system will be performed at a minimum of once per year. Modification to the frequency or duration of the inspections will require approval from NYSDEC. Site-wide inspections will also be performed after all severe weather conditions that may affect ECs. During these inspections, an inspection form will be completed, as provided in Appendix H, Site Management/Inspection Forms. The form will compile sufficient information to assess the following:

- Compliance with all ICs, including Site usage;
- An evaluation of the condition and continued effectiveness of ECs;
- General Site conditions at the time of the inspection;
- The Site management activities being conducted, including, where appropriate, confirmation sampling and a health and safety inspection; and
- Confirmation that Site records are up to date.

Inspections of all remedial components installed at the Site will be conducted. A comprehensive Site-wide inspection will be conducted and documented according to the SMP schedule, regardless of the frequency of the Periodic Review Report (PRR). The inspections will determine and document the following:

- Whether ECs continue to perform as designed;
- If these controls continue to be protective of human health and the environment;

- Compliance with requirements of this SMP and the EE;
- Achievement of remedial performance criteria; and
- If Site records are complete and up to date.

Reporting requirements are outlined in Section 7.0 of this plan.

Inspections will also be performed in the event of an emergency. If an emergency such as a natural disaster or an unforeseen failure of any of the ECs occurs that reduces or has the potential to reduce the effectiveness of ECs in place at the Site, verbal notice to NYSDEC or its successor agency must be given by noon of the following day. In addition, an inspection of the Site will be conducted within 5 days of the event to verify the effectiveness of the ICs/ECs implemented at the Site by a qualified environmental professional, as determined by NYSDEC. Written confirmation must be provided to NYSDEC within 7 days of the event that includes a summary of actions taken, or to be taken, and the potential impact to the environment and the public.

4.6 Monitoring Quality Assurance/Quality Control

All sampling and analyses will be performed in accordance with the requirements of the Quality QAPP prepared for the Site (Appendix E). Main Components of the QAPP include:

- QA/QC Objectives for Data Measurement;
- Sampling Program:
  - Samples will be collected into laboratory-supplied containers.
  - Sample holding times will be in accordance with the NYSDEC ASP requirements.
- Field QC samples (e.g., trip blanks, coded field duplicates, and matrix spike/matrix spike duplicates) will be collected as necessary.
- Sample Tracking and Custody;
- Calibration Procedures:
  - All field analytical equipment will be calibrated immediately prior to each day's use and will follow all calibration procedures and schedules as specified in USEPA SW-846 and subsequent updates that apply to the instruments used for the analytical methods.
- Analytical Procedures;
- Preparation of a DUSR, which will present the results of data validation, including a summary assessment of laboratory data packages, sample preservation and chain of custody procedures, and a summary assessment of precision, accuracy, representativeness, comparability, and completeness for each analytical method.
- Internal QC and Checks;
- QA Performance and System Audits;
- Preventative Maintenance Procedures and Schedules; and
- Corrective Action Measures.

5.0 OPERATION AND MAINTENANCE PLAN

5.1 Introduction

This Operation and Maintenance (O&M) Plan describes the measures necessary to operate, monitor and maintain the mechanical components of the remedy selected for the Site. This Operation and Maintenance Plan:

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

Information on non-mechanical Engineering Controls (the Site cover system) is provided in Section 3.3.1 and Section 4.2 of this SMP. A copy of this Operation and Maintenance Plan, along with the complete SMP, will be kept at the Site. This Operation and Maintenance Plan is not to be used as a stand-alone document, but as a component document of the SMP.

5.2 Engineering Control System Operation and Maintenance

5.2.1 Groundwater Treatment System

The treatment of dissolved petroleum and solvent compounds in groundwater, and contaminated soil remaining below the water table at the Site (due to physical and structural constraints) is being addressed by the groundwater treatment system. Section 3.3.2 includes a detailed review of the equipment and treatment processes. This Section includes a review of the scope of work for operation and monitoring of the treatment system.

5.2.1.1. Groundwater Treatment System Scope

The groundwater treatment system is designed to operate continuously, 24 hours a day, 7 days a week, 365 days a year, except for potential temporary shutdowns associated with any required adjustments or repairs. Manufacturer's specifications for each of the groundwater treatment system components are included in Appendix J and should be consulted prior to any repairs or adjustments that may become necessary. Regular system inspections, operation parameter documentation, and performance assessment guidelines are detailed in Section 4.3 and 4.5 of this SMP.

5.2.1.2. Groundwater Treatment System Monitoring

The groundwater treatment system is already in operation at the Site. After any future event that requires groundwater treatment system start-up, the following inspections and testing will be performed to ensure the treatment system is balanced:

- Confirmation of acceptable extraction well air manifold pressure (approximately 10 to 35 psi) from each individual extraction well air line by a visual inspection of the gauges affixed to the extraction well air manifold;
- Confirmation of acceptable pressure (approximately 30 to 50 psi) from the total extraction well manifold by a visual inspection of the gauge affixed to the extraction well air manifold;
- Review of the pressure gauges and calculated pressure loss across the bag filter #1, bag filter #2, and the Bonifiber™ and GAC treatment vessels. If significant pressure loss

(>10 psi between each individual treatment component), bag filters should be inspected and replaced as needed;

- If pressure loss issues remain following bag filter replacement, Bonifiber™ and GAC backwash and/or changeout should be performed; and
- Confirmation of the integrity of piping and connections for the various injection and extraction fluid and air lines connected to the various manifolds in the basement treatment room through visual inspection.

5.2.1.3. Groundwater Treatment System Operation: Detailed Operation Procedures

Operation of the groundwater treatment system will be monitored in accordance with the frequency and detail set forth in Section 4.5 and In-Text Table 5 of this SMP. Monitoring of the groundwater treatment will consist of a visual inspection of the associated air pressure and totalizer gauges, and alarms to confirm system diagnostics, and identification and repair of any system malfunctions or problems (i.e. leaks, cracks, collection of condensation, etc.).

The groundwater treatment system will operate continuously at the Site and not be discontinued without written approval by NYSDEC. A proposal to discontinue the groundwater treatment will be submitted by the property owner based on confirmatory data that justifies the request. The groundwater treatment system will remain in place and operational until permission to discontinue use is granted in writing by NYSDEC. Details pertaining to equipment monitoring are included in Section 4.5 of this SMP.

5.2.1.4. Groundwater Treatment System: Non-Routine Equipment Maintenance

Non-routine maintenance may be required if non-optimal operating conditions are indicated by the system alarms and system telemetry. The primary objective of system telemetry is to notify personnel when operating conditions are likely to reduce or otherwise compromise efficiency, which could lead to the reduction of treatment and associated remediation performance.

The system telemetry will also notify AKRF personnel when operating conditions could cause damage to the groundwater treatment equipment. The groundwater treatment system includes the alarm systems as noted in In-Text Table 7 in Section 5.3.3.

Portions of the groundwater treatment system may need to be replaced based on performance monitoring and Site inspection findings. If required, the system components will be replaced according to the specifications detailed in the QAPP. Any maintenance completed for the groundwater treatment system will be documented in the Maintenance Log included in Appendix K.

The NYSDEC will be notified prior to the replacement of major groundwater treatment system components, and the repair or decommissioning and replacement process will be documented in the subsequent Period Review Report. Significant groundwater treatment system modifications without replacement will be done only with the prior approval of NYSDEC.

5.3 Groundwater Treatment System Performance Monitoring

The groundwater treatment system has been installed at the Site to recover LNAPL and treat residual 1,2-DCA-contaminated groundwater and soil left in place at the Site. The upgraded groundwater treatment system began operating at the Site on July 1, 2021. As-built drawings for the groundwater treatment system are included in Appendix L, and the treatment system component

specifications are included in Appendix J. Details pertaining to the performance monitoring of these ECs are outlined below.

5.3.1 Groundwater Treatment System Monitoring Schedule

The operation of the groundwater treatment system components will be confirmed by treatment system inspections performed by an environmental consultant to the current owner on a monthly basis for the first year after issuance of the COC. The monitoring schedule is included as In-Text Table 5 in Section 4 of this SMP. The groundwater treatment system inspection form to be used during the inspections are included in Appendix M.

Inspection frequency is subject to change with the approval of the NYSDEC. Unscheduled inspections and/or sampling may take place when a suspected failure of the groundwater treatment system has been reported or an emergency occurs that is deemed likely to affect the operation of the system. Monitoring deliverables for the groundwater treatment system are specified later in this Plan.

5.3.2 Groundwater Treatment System Equipment Monitoring

5.3.2.1. Treatment System Inspections

The following list of items will be noted and inspected during Treatment System Inspections performed on a monthly basis:

- Note measured pressure in pound-force per square inch (psi) in the air compressor by a visual inspection of the pressure gauge on top of the air compressor;
- Note the oil level in the air compressor by a visual inspection of the oil viewing glass on the top of the air compressor. Replenish the oil if the oil level is below halfway;
- Note measured pressure in psi from each of extraction well air lines and extraction well fluid lines by a visual inspection of pressure gauges on the respective extraction well air and fluid manifolds;
- Note measured pressure in psi from the total extraction well air manifold by a visual inspection of pressure gauge on the extraction well air manifold;
- Note measured extracted fluid volume in gallons from each of extraction well fluid line by a visual inspection of the totalizer gauges on the extracted well fluid manifold;
- Note the measured pressure in psi at the OWS effluent pump by a visual inspection of pressure gauge on the OWS effluent pump. This reading is considered the pre-bag filter #1 pressure reading; Note that this measurement can only be collected when the OWS effluent pump is running. If the pump is not running at the time of inspection, confirm sufficient volume remains in the OWS and place the OWS effluent pump in "hand" mode on the control panel to collect the measurement[2];
- Note the measured pressure in psi at bag filter #2 by a visual inspection of pressure gauge on the top lid of bag filter #2. This reading is considered the post-bag filter #1 pressure reading; note that this measurement can only be collected with the OWS effluent pump running. If the pump is not running at the time of inspection, confirm sufficient volume remains in the OWS and place the OWS effluent pump in "hand" mode on the control panel to collect the measurement[2];

[2] Then return the OWS effluent pump to "auto" mode

- Note the measured pressure in psi at the influent of the Bonifiber™ treatment vessel by a visual inspection of pressure gauge on the bottom influent port of the Bonifiber™ treatment vessel. This reading is considered the post-bag filter #2 pressure reading; note that this measurement can only be collected with the OWS effluent pump is running. If the pump is not running at the time of inspection, confirm sufficient volume remains in the OWS and place the OWS effluent pump in "hand" mode on the control panel[2];
- Note the measured pressure in psi at the influent of GAC #1 treatment vessel by a visual inspection of pressure gauge on the left/influent portion of the GAC fitting on the top of GAC #1 treatment vessel. This reading is considered the post-Bonifiber™ filter pressure reading. Note that this measurement can only be collected with the OWS effluent pump is running. If the pump is not running at the time of inspection, confirm sufficient volume remains in the OWS and place the OWS effluent pump in "hand" mode on the control panel[2];
- Note the measured pressure in psi at the effluent of GAC #1 treatment vessel by a visual inspection of pressure gauge on the right/effluent portion of the GAC fitting on the top of GAC #1 treatment vessel. This reading is considered the post-GAC #1 filter pressure reading; Note that this measurement can only be collected with the OWS effluent pump is running. If the pump is not running at the time of inspection, confirm sufficient volume remains in the OWS and place the OWS effluent pump in "hand" mode on the control panel[2];
- Note the analog totalizer in cubic feet per minute (CFM) at the sewer discharge totalizer by a visual inspection of the sewer discharge totalizer. Note that 7.48 gallons is equal to 1 cubic foot;
- Note the mixing tank totalizer volume by a visual inspection of digital gauge adjacent to the surfactant/oxygen infuser pump;
- Note the volume of extracted groundwater within the plastic mixing tank by a visual inspection of the graduated tank;
- Note level of oil/product collected in knockout tank during operation (and perform transfer of product to 55-gallon drum as necessary);
- Note measured pressure in psi from the individual injection wells by a visual inspection of pressure gauge on the individual injection well lines on the injection well manifold; Note that this measurement can only be collected with the injection pump running. If the pump is not running at the time of inspection, confirm sufficient volume remains in the plastic mixing tank and place the injection pump in "hand" mode on the digital control panel[3];
- Note the total re-injected fluid volume in gallons by a visual inspection of the total influent totalizer gauge on the bottom right of the injection well manifold;
- Note measured injected fluid volume in cubic feet from each of injection well fluid lines by a visual inspection of the totalizer gauges on the individual injection legs on the injection well manifold. Note that 7.48 gallons is equal to 1 cubic foot;
- Note measured pressure in psi from the injection pump by a visual inspection of pressure gauge on the injection pump; Note that this measurement can only be collected when the injection pump is running. If the pump is not running at the time of

[3] Then return the injection pump to "auto" mode;

inspection, confirm sufficient volume remains in the plastic mixing tank and place the injection pump in "hand" mode on the control panel to collect the pressure reading;

- Note any groundwater treatment amendments that are manually added to the effluent mixing tank (i.e. nutrients for Phase 2 treatment, etc.);
- Review the digital electronic control panel to confirm the panel is operating correctly and confirm that all operational switches are placed in their correct position (i.e. "Auto", "Off", or "Hand");
- Note approximate level of NAPL/product stored in the on-site 55-gallon product storage drum; and
- Inspect and note structural integrity of the groundwater treatment system components and collect photographs as needed.

A visual inspection of the complete groundwater treatment system will be conducted during each monitoring event. A complete list of components to be checked during the respective monitoring events is provided in the Inspection Checklist. The groundwater treatment system inspection form to be utilized during the monitoring events is included in Appendix M. If any equipment readings are not within their typical range, any equipment is observed to be malfunctioning, or the system is not performing within specifications, maintenance and repair as per the Operation and Maintenance Plan should be conducted as appropriate, and the groundwater treatment system restarted. The treatment system inspection log and the SMP will be updated if upgrades or modifications are made to the groundwater treatment system.

5.3.3 System Monitoring Devices and Alarms

The alarm system associated with the groundwater treatment system is equipped with an internet connection, which will send an automatic notification to a designated contact list in the event of a system component failure at the Site. The groundwater treatment system includes the following alarm systems:

In-Text Table 7
Groundwater Treatment System Alarm Types

Alarm	Equipment/Media Monitored	Parameters
Alarm 1	Air Pressure at Air Compressor	Low pressure alarm is triggered upon the loss of air pressure in the air compressor below 10 psi
Alarm 2	Groundwater Volume within Oil Water Separator	A high level alarm is triggered when the volume within the clean water chamber of the oil water separator reaches the maximum set point, approx. 90% of the total clean water chamber capacity
Alarm 3	Oil Water Separator Effluent Pump	Low flow alarm is triggered when the flow rate from the oil water separator effluent pump is below 0.1 gallons per minute (GPM)
Alarm 4	Chemical/ Amendment Tank	A low level alarm and a low-low level alarm are triggered when the volume within the chemical tank reaches the set points of the respective controls

Alarm	Equipment/Media Monitored	Parameters
Alarm 5	Effluent Mixing Tank	A low level alarm is triggered when the volume within the effluent mixing tank reaches the set points of the low level control to stop operation of the injection pump.
Alarm 6		A high level alarm and a high-high level alarm are triggered when the volume within the effluent mixing tank reaches the set points of the respective level controls to trigger the injection pump to turn on and system shut-off for high-high level alarm condition.
Alarm 7	Air Pressure at Injection Pump	High pressure alarm is triggered upon the increase of air pressure in the centrifugal injection pump line above 45 psi
Alarm 8	LNAPL Knockout Tank	A high level alarm is triggered when the volume within the LNAPL knockout tank reaches the set point of the high level control to trigger the extraction well pumps to turn off.

In the event that a groundwater treatment system alarm is activated, a remote notification will be made to project personnel and applicable maintenance and repairs will be conducted, as specified in the Operation and Maintenance Plan, and the groundwater treatment system will be restarted. Operational problems will be noted in the subsequent Periodic Review Report.

5.4 Contingency Plan

Emergencies may include injury to personnel, fire or explosion, environmental release, or serious weather conditions.

The appropriate action for on-site emergencies are detailed in the attached Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP), provided as Appendix D.

5.4.1 Emergency Telephone Numbers

In the event of any environmentally-related situation or unplanned occurrence requiring assistance, the Owner or Owner's representative(s) should contact the appropriate party from the contact list below. For emergencies, appropriate emergency response personnel should be contacted. Prompt contact should also be made to AKRF's Project Principal or Project Manager or the current property manager/owner's representative for the Site. Emergency contact lists must be maintained in an easily accessible location at the Site. In-Text Table 8 includes contact information for the emergency response personnel.

In-Text Table 8
Emergency Contact Numbers

Medical, Fire, and Police:	911
One Call Center:	(800) 272-4480

	(3 day notice required for utility mark out)
Poison Control Center:	(800) 222-1222
Pollution Toxic Chemical Oil Spills:	(800) 424-8802
NYSDEC Spills Hotline	(800) 457-7362

5.4.2 Map and Directions to Nearest Health Facility

Site Location: 34 Berry Street

Nearest Hospital Name: Woodhull Medical Center

Hospital Location: 760 Broadway, Brooklyn, NY 11205

Hospital Telephone: (718) 963-9000

Directions to Hospital:

1. Go NORTHEAST on Berry Street
2. Continue onto Nassau Avenue
3. Turn LEFT onto Bedford Avenue
4. Turn RIGHT onto Lorimer Street
5. Turn LEFT onto Broadway
6. Turn RIGHT on Flushing Avenue
7. The Emergency Department entrance will be at the intersection of Flushing Avenue and Throop Avenue.

A map showing the route from the Site to the Hospital is included in Appendix D.

6.0 PERIODIC ASSESSMENTS/EVALUATIONS

6.1 Climate Change Vulnerability Assessment

Increases in both the severity and frequency of storms/weather events, an increase in sea level elevations along with accompanying flooding impacts, shifting precipitation patterns and wide temperature fluctuation, resulting from global climactic change and instability, have the potential to significantly impact the performance, effectiveness and protectiveness of a given site and associated remedial systems. Vulnerability assessments provide information so that the site and associated remedial systems are prepared for the impacts of the increasing frequency and intensity of severe storms/weather events and associated flooding.

This section provides a summary of vulnerability assessments that will be conducted for the Site during periodic assessments, and briefly summarizes the vulnerability of the Site and/or ECs to severe storms/weather events and associated flooding.

- Flood Plain: The Site is not located within a flood plain.
- Site Drainage and Storm Water Management: Stormwater at the Site and the surrounding area flows to the New York City combined sewer system.
- Erosion: As the only areas of the Site not covered with concrete slabs are surrounded by buildings, erosion is not anticipated to be an issue of concern.
- High Wind: All permanent building components are secured against high winds. In the event that high winds are forecast for the Site, proper precautions will be taken to secure or shelter any Site components that are not protected against high winds.
- Electricity: Electricity to the buildings is supplied via newly installed underground vaults and conduits and is not expected to be affected by severe weather events.
- Spill/Contaminant Release: Storage of large amounts of fuel oil, or other chemicals at the Site is not expected. Nominal amounts of cleaning chemicals are likely to be stored throughout the Site but are not expected to be affected by severe weather conditions.

6.2 Green Remediation Evaluation

NYSDEC's DER-31 Green Remediation requires that green remediation concepts and techniques be considered during all stages of the remedial program, including site management, with the goal of improving the sustainability of the cleanup and summarizing the net environmental benefit of any implemented green technology. This section of the SMP provides a summary of any green remediation evaluations to be completed for the Site during site management, and as reported in the PRR.

6.2.1 Remedial Systems

Remedial systems will be operated properly considering the current Site conditions to conserve materials and resources to the greatest extent possible. Consideration will be given to operating rates and use of reagents and consumables. Spent materials will be sent for recycling, as appropriate.

6.2.2 Building Operations

Structures including buildings and sheds will be operated and maintained to provide for the most efficient operation of the remedy, while minimizing energy, waste generation and water consumption.

6.2.3 Frequency of System Checks, Sampling and Other Periodic Activities

Transportation to and from the Site and use of consumables in relation to visiting the Site to conduct inspections or collect samples and shipping samples to a laboratory for analyses have direct and/or inherent energy costs. The schedule and/or means of these periodic activities have been prepared so that these tasks can be accomplished in a manner that does not impact remedy protectiveness but reduces expenditure of energy or resources.

6.3 Remedial System Optimization

A Remedial Site Optimization (RSO) study will be conducted any time that NYSDEC or the remedial party requests in writing that an in-depth evaluation of the remedy is needed. An RSO may be appropriate if any of the following occur:

- The remedial actions have not met or are not expected to meet RAOs in the time frame estimated in the DD;
- The management and operation of the remedial system is exceeding the estimated costs;
- The remedial system is not performing as expected or as designed;
- Previously unidentified source material may be suspected;
- Plume shift has potentially occurred;
- Site conditions change due to development, change of use, change in groundwater use, etc.;
- There is an anticipated transfer of the Site management to another remedial party or agency; or
- A new and applicable remedial technology becomes available.

A RSO will provide a critique of a site's conceptual model, give a summary of past performance, document current cleanup practices, summarize progress made toward the site's cleanup goals, gather additional performance or media specific data and information, and provide recommendations for improvements to enhance the ability of the present system to reach RAOs or to provide a basis for changing the remedial strategy.

The RSO study will focus on overall site cleanup strategy, process optimization, and management, with the intent of identifying impediments to cleanup and improvements to site operations to increase efficiency, cost effectiveness, and remedial time frames. Green remediation technology and principals are to be considered when performing the RSO.

7.0 REPORTING REQUIREMENTS

Maintenance reports (if any) and any other information generated during regular operations at the Site will be kept on file on-site. All reports, forms, and other relevant information generated will be available upon request to NYSDEC and submitted as part of the PRR, as specified in Section 7.2 of this SMP. All site management inspection, maintenance, and monitoring events will be conducted by a qualified environmental professional as defined in 6 NYCRR Part 375, a P.E. who is licensed and registered in New York State, or a qualified person who directly reports to a P.E. who is licensed and registered in New York State.

7.1 Site Management Reports

All Site management inspections and maintenance and monitoring events will be recorded on the appropriate Site management forms provided in Appendices H, K and M. These forms are subject to NYSDEC revision.

All applicable inspection forms and other records, including media sampling data generated for the Site during the reporting period, will be provided in electronic format to NYSDEC in accordance with the requirements of In-Text Table 9 and summarized in the PRR.

In-Text Table 9
Schedule of Monitoring/Inspection Reports

Task/Report	Reporting Frequency*
Monitoring/Inspection Letter Report with Figures and Attachments (Treatment System Inspections and Associated Sampling Events)	Quarterly
Periodic Review Report (Inclusive of All Inspections and Sampling Events)	Annually. First inspection no more than 16 months after COC, then at least annually thereafter and PRR due 1 month later.

Note: * The frequency of events will be conducted as specified until otherwise approved by NYSDEC.

All monitoring/inspections reports will include, at a minimum:

- Date of event or reporting period;
- Name, company, and position of person(s) conducting monitoring/inspection activities;
- Description of the activities performed;
- Where appropriate, color photographs and/or sketches showing the approximate location of any problems or incidents noted (included either on the checklist/form or on an attached sheet);
- Type of samples collected (e.g., groundwater, sub-slab vapor, indoor air, outdoor air, etc.);
- Copies of all field forms completed (e.g., well sampling logs, chain-of-custody documentation, etc.);
- Sampling results in comparison to appropriate standards/criteria;
- A figure illustrating sample type and sampling locations;
- Copies of all laboratory data sheets and the required laboratory data deliverables required for all points sampled (to be submitted electronically in the NYSDEC-identified format);
- Any observations, conclusions, or recommendations; and
- A determination as to whether contaminant conditions have changed since the last reporting event.

Routine maintenance event reporting forms will include, at a minimum:

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

Non-routine maintenance event reporting forms will include, at a minimum:

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

Data will be reported in digital format as determined by NYSDEC. Currently, data is to be supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.

7.2 Periodic Review Report (PRR)

The first PRR was submitted to the NYSDEC 16 months after the COC was issued. After submittal of the initial PRR, the next PRR shall be submitted to the NYSDEC annually or at another frequency as may be required NYSDEC. In the event that the Site is subdivided into separate parcels with different ownership, a single PRR will be prepared that addresses the Site described in the EE (Appendix A). The PRR will be prepared in accordance with NYSDEC's DER-10 and submitted within 30 days of the end of each certification period. Media sampling results will also be incorporated into the PRR. The report will include:

- Identification, assessment and certification of all ECs/ICs required by the remedy for the Site;
- Results of the required annual site inspections and severe condition inspections, if applicable;
- All applicable site management forms and other records generated for the Site during the reporting period in the NYSDEC-approved electronic format, if not previously submitted;
- Identification of any wastes generated during the reporting period, along with waste characterization data, manifests, and disposal documentation;
- A summary of any discharge monitoring data and/or information generated during the reporting period, with comments and conclusions;
- Data summary tables and graphical representations of contaminants of concern by media (groundwater, etc.), which include a listing of all compounds analyzed, along with the applicable standards, with all exceedances highlighted. These tables and figures will include a presentation of past data as part of an evaluation of contaminant concentration trends, including but not limited to:

  - Trend monitoring graphs that present groundwater contaminant levels from before the start of the remedy implementation to the most current sampling data; and
  - Trend monitoring graphs depicting system influent analytical data on a per event and cumulative basis.

- O&M data summary tables;
- A current plume map for sites with remaining groundwater contamination;
- A groundwater elevation contour map for each gauging event; and
- Results of all analyses, copies of all laboratory data sheets, and the required laboratory data deliverables for all samples collected during the reporting period will be submitted in digital format as determined by the NYSDEC. Currently, data is supplied electronically and submitted to the NYSDEC EQuIS™ database in accordance with the requirements found at this link: http://www.dec.ny.gov/chemical/62440.html.
- A Site evaluation, which includes the following:
  - The compliance of the remedy with the requirements of the site-specific RAWP and DD;
  - The operation and effectiveness of the ECs, including identification of any needed repairs or modifications;
  - Any new conclusions or observations regarding Site contamination based on inspections or data generated;
  - Recommendations regarding any necessary changes to the remedy and/or Monitoring and Sampling Plan; and
  - An evaluation of trends in contaminant levels in the affected media to determine if the remedy continues to be effective in achieving remedial goals as specified by the RAWP, ROD or Decision Document; and
  - The overall performance and effectiveness of the remedy.
- In addition, a performance summary for all treatment systems at the site during the calendar year, including information such as:
  - The amount of NAPL removed during the certification period and during the life of the treatment system;
  - A description of breakdowns and/or repairs along with an explanation for any significant downtime;
  - A description of the resolution of performance problems;
  - Alarm conditions;
  - Trends in equipment failure;
  - A summary of the performance, effluent and/or effectiveness monitoring; and
  - Comments, conclusions, and recommendations based on data evaluation. Recommendations must address how receptors would be impacted. Recommendations can include:
    - Proposals to address efficiency such as: instituting remote operation, system changes to decrease maintenance and downtime, and system changes to decrease energy use; and

- Proposals to modify or shut down a treatment system due to remediation completion, system performance or changed conditions. System shutdowns are addressed in Section 6.4 of DER-10.

7.2.1 Certification of Institutional and Engineering Controls

Following the last inspection of the reporting period, a Professional Engineer licensed to practice in New York State will prepare, and include in the PRR, the following certification as per the requirements of NYSDEC DER-10:

"For each institutional or engineering control identified for the site, I certify that all of the following statements are true:

- *The inspection of the Site to confirm the effectiveness of the Institutional and Engineering Controls required by the remedial program was performed under my direction;*
- *The Institutional Control and/or Engineering Control employed at this Site is unchanged from the date the control was put in place, or last approved by the Department;*
- *Nothing has occurred that would impair the ability of the control to protect the public health and environment;*
- *Nothing has occurred that would constitute a violation or failure to comply with any Site Management Plan for this control;*
- *Access to the Site will continue to be provided to the Department to evaluate the remedy, including access to evaluate the continued maintenance of this control;*
- *Use of the site is compliant with the Environmental Easement;*
- *The Engineering Control systems are performing as designed and are effective;*
- *To the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program and generally accepted engineering practices;*
- *No new information has come to my attention, including groundwater monitoring data from wells located at the Site boundary, if any, to indicate that the assumptions made in the qualitative exposure assessment of off-site contamination are no longer valid; and*
- *The assumptions made in the qualitative exposure assessment remain valid, and the information presented in this report is accurate and complete.*

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, [name], of [business address], am certifying as [Owner/Remedial Party or Owner's/Remedial Party's Designated Site Representative]."

"I certify that the New York State Education Department has granted a Certificate of Authorization to provide Professional Engineering services to the firm that prepared this Periodic Review Report."

The signed certifications will be included in the PRR.

The PRR will be submitted, in electronic format, to the NYSDEC project manager in which the Site is located and the NYSDOH project manager. The PRR may need to be submitted in hard-copy format, if requested by the NYSDEC project manager.

7.3 Corrective Measures Work Plan

If any component of the remedy is found to have failed, or if the periodic certification cannot be provided due to the failure of an IC or EC, a Corrective Measures Work Plan (CMWP) will be submitted to NYSDEC for approval. This plan will explain the failure and provide the details and schedule for performing work necessary to correct the failure. Unless an emergency condition exists, no work will be performed pursuant to the CMWP until it has been approved by NYSDEC.

7.4 Remedial Site Optimization Report

In the event that an RSO is to be performed (see Section 6.4), upon completion of a RSO, a RSO report must be submitted to the NYSDEC for approval. The RSO report will document the research/ investigation and data gathering that was conducted, evaluate the results and facts obtained, present a revised conceptual site model, and present recommendations. RSO recommendations are to be implemented upon approval from NYSDEC. Additional work plans, design documents, HASPs, etc., may still be required to implement the recommendations, based upon the actions that need to be taken. An FER and update to the SMP may also be required.

The RSO report will be submitted, in electronic format, to the NYSDEC Central Office, Regional Office in which the Site is located, Site Control and the NYSDOH Bureau of Environmental Exposure Investigation.

8.0 REFERENCES

- 6NYCRR Part 375, Environmental Remediation Programs. December 14, 2006.
- NYSDEC DER-10 – "Technical Guidance for Site Investigation and Remediation".
- NYSDEC, 1998. Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations Division of Water Technical and Operational Guidance Series (TOGS) 1.1.1. June 1998 (April 2000 addendum).
- *Phase I Environmental Site Assessment (ESA),* 34 Berry Street, Brooklyn, New York; prepared by Langan Engineering and Environmental Services (Langan); prepared for Atherton-Newport; dated June 15, 2006.
- *Phase II Environmental Site Investigation (ESI),* 34 Berry Street, Brooklyn, New York; prepared by Langan; prepared for Atherton-Newport; dated June 27, 2006.
- *Environmental Subsurface Investigation Report,* 34 Berry Street, Brooklyn, New York; prepared by Landmark Consultants, Inc. (Landmark); prepared for Atherton-Newport; dated April 2007.
- *Supplemental Remedial Investigation Report,* 34 Berry Street, Brooklyn, New York; prepared by Landmark; prepared for New York State Department of Environmental Conservation (NYSDEC); dated March 20, 2008.
- *Remedial Action Plan and Construction Health and Safety Plan,* 34 Berry Street, Brooklyn, New York; prepared by Landmark, February 2008.
- *Soil Corrective Action and Remedial Subsurface Investigation,* 34 Berry Street, Brooklyn, New York; prepared by Impact Environmental Restoration, Inc. (Impact), September 2008.
- *Soil Remedial Action Plan Addendum,* 34 Berry Street, Brooklyn, New York; prepared by Landmark, April 2009.
- *Closure Report*, 34 Berry Street, Brooklyn, New York; AKRF Engineering, P.C.; dated April 9, 2010.
- *Closure Report Addendum*, 34 Berry Street, Brooklyn, New York; AKRF Engineering, P.C.; dated March 2010.
- *Off-Site Investigation Report*, 34 Berry Street, Brooklyn, New York; AKRF, Inc.; dated November 2010.
- *Phase I Environmental Site Assessment (ESA)* – 44 Berry Street, Brooklyn, New York, IVI Assessment Services, Inc., March 30, 2011.
- *OM&M Status Report*, 34 Berry Street, Brooklyn, New York; AKRF, Inc., May to June 2013.
- *OM&M Monitoring Report*, 34 Berry Street, Brooklyn, New York; AKRF, Inc., February to October 2016.
- *Brownfield Cleanup Agreement* – 34 Berry Street, Kings County, Brooklyn, New York, March 20, 2018.
- *Remedial Investigation Work Plan,* 34 Berry Street, Brooklyn, New York; AKRF, Inc., July 2018.
- *Interim Remedial Measures Work Plan,* 34 Berry Street, Brooklyn, New York; AKRF, Inc., March 2019.
- *Soil Vapor Sampling Results Letter Report* - 44 Berry Street, Brooklyn, New York, Roux Environmental Engineering and Geology, D.P.C., May 2, 2019.

- *Air Sampling Results Letter Report* - 44 Berry Street, Brooklyn, New York, Roux Environmental Engineering and Geology, D.P.C., August 13, 2019.
- *Remedial Investigation Report* - 34 Berry Street, Brooklyn, New York, AKRF, Inc., November 2019.
- *Pre-Design Investigation Work Plan* - 34 Berry Street, Brooklyn, New York, AKRF, Inc., June 2020.
- *Remedial Action Work Plan* - 34 Berry Street, Brooklyn, New York, AKRF, Inc., November 2020.
- *Remedial Investigation Report Addendum Letter* - 34 Berry Street, Brooklyn, New York, AKRF, Inc., January 2021.
- *Remedial Action Work Plan Addendum* - 34 Berry Street, Brooklyn, New York, AKRF, Inc., January 2021.
- *In-Situ Design Document* - 34 Berry Street, Brooklyn, New York, AKRF, Inc., January 2021
- *Decision Document* – 34 Berry Street, BCP Site No. C224268, Brooklyn, New York, February 2021.
- *OM&M Report* – 34 Berry Street, Brooklyn, New York, AKRF, Inc., November 17, 2021
- *Boundary Survey* – 34 Berry Street, Brooklyn, New York, DPK Land Surveying, LLC, November 11, 2021 (revised 5/26/2022).
- *Periodic Review Report* – 34 Berry Street, Brooklyn, New York, AKRF, Inc., May 2024
- *Periodic Review Report* – 34 Berry Street, Brooklyn, New York, AKRF, Inc., May 2026

TABLES

Table 1
34 Berry Street
Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-1 (IW-10)	**Historical DTW range: 8.3 to 12.9**							
	Historical LNAPL Thickness range: ND to 1.8							
	102.39	3/27/2009	NM	13.08	89.31	8.29	4.79	92.90
	102.39	8/25/2009	NM	12.92	89.47	NA	NA	89.47
	102.39	10/2/2009	NM	8.67	93.72	8.64	0.03	93.74
	102.39	3/27/2010*	NM	NM	NM	NM	NM	NM
	102.39	4/27/2010	NM	8.65	93.74	8.34	0.31	93.97
	102.39	5/17/2010	NM	8.54	93.85	8.29	0.25	94.04
	102.39	6/28/2010	NM	8.60	93.79	8.26	0.34	94.05
	102.39	7/29/2010	NM	8.57	93.82	NA	NA	93.82
	102.39	9/7/2010	NM	8.53	93.86	NA	NA	93.86
	96.81	10/6/2010	NM	7.42	89.39	NA	NA	89.39
	96.81	11/24/2010	NM	12.98	83.83	NA	NA	83.83
	96.81	1/3/2011	NM	8.68	88.13	8.55	0.13	88.23
	96.81	2/11/2011	NM	8.52	88.29	8.43	0.09	88.36
	96.81	3/9/2011	NM	8.08	88.73	NA	NA	88.73
	96.81	4/11/2011	NM	8.12	88.69	NA	NA	88.69
	96.81	5/10/2011	NM	8.10	88.71	NA	NA	88.71
	96.81	6/15/2011	NM	8.07	88.74	NA	NA	88.74
	96.81	7/13/2011	NM	8.04	88.77	NA	NA	88.77
	96.81	8/9/2011	NM	7.92	88.89	NA	NA	88.89
	96.81	9/8/2011	NM	7.25	89.56	7.24	0.01	89.57
	96.81	9/22/2011	NM	12.63	84.18	NA	NA	84.18
	96.81	9/29/2011	NM	7.23	89.58	NA	NA	89.58
	96.81	12/14/2011	NM	13.01	83.80	NA	NA	83.80
	96.81	12/15/2011	NM	7.30	89.51	NA	NA	89.51
	96.81	1/26/2012	NM	13.07	83.74	NA	NA	83.74
	96.81	1/27/2012	NM	7.87	88.94	NA	NA	88.94
	96.81	2/28/2012	NM	13.00	83.81	NA	NA	83.81
	96.81	2/29/2012	NM	8.53	88.28	NA	NA	88.28
	96.81	3/26/2012	NM	12.94	83.87	NA	NA	83.87
	96.81	3/27/2012	NM	9.07	87.74	NA	NA	87.74
	96.81	4/19/2012	NM	8.90	87.91	NA	NA	87.91
	96.81	4/20/2012	NM	8.89	87.92	NA	NA	87.92
	96.81	5/24/2012	NM	8.81	88.00	8.78	0.03	88.02
	96.81	5/25/2012	NM	8.69	88.12	8.68	0.01	88.13
	96.81	6/7/2012	NM	13.08	83.73	NA	NA	83.73
	96.81	6/8/2012	NM	9.76	87.05	NA	NA	87.05
	96.81	7/18/2012	NM	12.97	83.84	NA	NA	83.84
	96.81	7/19/2012	NM	8.85	87.96	NA	NA	87.96
	96.81	8/15/2012	NM	12.97	83.84	NA	NA	83.84
	96.81	8/16/2012	NM	9.84	86.97	NA	NA	86.97
	96.81	9/13/2012	12.81	12.78	84.03	NA	NA	84.03
	96.81	9/14/2012	12.63	12.51	84.30	NA	NA	84.30
	96.81	10/25/2012	NM	8.94	87.87	NA	NA	87.87
	96.81	10/26/2012	NM	8.86	87.95	NA	NA	87.95
	96.81	11/28/2012	10.77	10.26	86.55	NA	NA	86.55
	96.81	11/29/2012	NM	9.03	87.78	NA	NA	87.78
	96.81	12/19/2012	10.51	10.51	86.30	NA	NA	86.30
	96.81	12/20/2012	NM	9.00	87.81	NA	NA	87.81
	96.81	1/28/2013	10.95	8.86	87.95	NA	NA	87.95
	96.81	1/29/2013	NM	8.91	87.90	NA	NA	87.90
	96.81	2/25/2013	11.90	8.45	88.36	NA	NA	88.36
	96.81	2/26/2013	NM	8.72	88.09	NA	NA	88.09
	96.81	3/20/2013	12.22	8.40	88.41	NA	NA	88.41
	96.81	3/21/2013	NM	8.27	88.54	NA	NA	88.54

Table 1
34 Berry Street
Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-1 (IW-10)	96.81	4/29/2013	11.87	8.51	88.30	NA	NA	88.30
	96.81	4/30/2013	NM	8.52	88.29	8.49	0.03	88.31
	96.81	5/14/2013	11.84	8.23	88.58	8.21	0.02	88.60
	96.81	5/15/2013	NM	8.25	88.56	8.23	0.02	88.58
	96.81	6/17/2013	11.85	8.05	88.76	8.01	0.04	88.79
	96.81	6/18/2013	NM	8.05	88.76	8.03	0.02	88.78
	96.81	7/17/2013	12.78	8.46	88.35	8.39	0.07	88.40
	96.81	7/18/2013	NM	8.41	88.40	NA	NA	88.40
	96.81	8/27/2013	11.85	8.61	88.20	8.55	0.06	88.25
	96.81	8/28/2013	NM	8.63	88.18	NA	NA	88.18
	96.81	9/23/2013	11.88	8.96	87.85	8.79	0.17	87.98
	96.81	9/24/2013	NM	8.72	88.09	8.65	0.07	88.14
	96.81	10/24/2013	11.83	9.20	87.61	9.16	0.04	87.64
	96.81	10/25/2013	NM	9.17	87.64	9.05	0.12	87.73
	96.81	1/7/2014	11.84	9.11	87.70	9.00	0.11	87.78
	96.81	1/8/2014	NM	9.16	87.65	9.05	0.11	87.73
	96.81	4/22/2014	12.61	9.47	87.34	9.59	0.12	87.43
	96.81	4/23/2014	NM	8.95	87.86	8.76	0.19	88.00
	96.81	7/24/2014	13.12	9.43	87.38	9.23	0.20	87.53
	96.81	7/25/2014	NM	9.30	87.51	NA	NA	87.51
	96.81	10/13/2014	12.45	10.12	86.69	9.8	0.32	86.93
	96.81	10/14/2014	NM	10.04	86.77	9.74	0.30	87.00
	96.81	1/22/2015	12.11	9.29	87.52	9.28	0.01	87.53
	96.81	1/26/2015	12.11	9.15	87.66	9.13	0.02	87.68
	96.81	4/28/2015	17.55	12.25	84.56	12.24	0.01	84.57
	96.81	4/29/2015	17.55	8.77	88.04	NA	NA	88.04
	96.81	7/29/2015	NM	9.40	87.41	NA	NA	87.41
	96.81	7/30/2015	NM	8.90	87.91	NA	NA	87.91
	96.81	10/14/2015	17.33	8.98	87.83	8.97	0.01	87.84
	96.81	10/15/2015	NM	10.32	86.49	NA	NA	86.49
	96.81	1/20/2016	12.34	9.12	87.69	NA	NA	87.89
	96.81	1/21/2016	NM	8.92	87.89	8.91	0.01	87.90
	96.81	4/19/2016	12.34	8.78	88.03	8.77	0.01	88.04
	96.81	4/20/2016	NM	8.85	87.96	8.81	0.04	87.99
	13.97	7/13/2016	12.30	8.67	5.30	8.66	0.01	5.31
	13.97	7/14/2016	NM	8.69	5.28	8.67	0.02	5.30
	13.97	10/25/2016	12.30	9.30	4.67	9.03	0.27	4.87
	13.97	10/26/2016	NM	9.25	4.72	9.02	0.23	4.89
	13.97	1/31/2017	12.84	9.26	4.71	9.00	0.26	4.91
	13.97	2/1/2017	NM	9.01	4.96	9.01	Sheen	4.96
	13.97	4/25/2017	12.62	8.41	5.56	9.00	Sheen	5.56
	13.97	4/26/2017	NM	8.37	5.60	9.01	Sheen	5.60
	13.97	7/24/2017	16.32	8.03	5.94	8.03	Sheen	5.94
	13.97	7/25/2017	NM	7.97	6.00	7.97	Sheen	6.00
	13.97	10/9/2017	16.30	8.73	5.24	8.73	Sheen	5.24
	13.97	10/10/2017	NM	8.81	5.16	8.81	Sheen	5.16
	13.97	2/1/2018	10.40	9.05	4.92	8.95	0.10	5.00
	13.97	2/2/2018	10.43	9.15	4.82	8.99	0.16	4.94
	13.97	4/25/2018	10.15	8.37	5.60	NA	Sheen	5.60
	13.97	4/26/2018	10.15	8.52	5.45	8.51	0.01	5.46
	13.97	7/26/2018	11.49	8.66	5.31	8.63	0.03	5.33
	13.97	7/27/2018	11.49	8.61	5.36	8.61	Sheen	5.36
	13.97	11/5/2018	11.45	8.88	5.09	8.71	0.17	5.22
	13.97	11/6/2018	10.67	8.78	5.19	8.65	0.13	5.29
	13.97	6/27/2019	17.31	12.41	1.56	NA	NA	1.56
	13.97	6/28/2019	17.31	12.44	1.53	NA	NA	1.53

Table 1
34 Berry Street
Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-1 (IW-10)	13.97	9/26/2019	15.03	12.90	1.07	NA	NA	1.07
	13.97	9/27/2019	15.03	12.90	1.07	NA	NA	1.07
	13.97	12/30/2019	9.89	8.19	5.78	8.15	0.04	5.81
	13.97	12/31/2019	9.90	8.25	5.72	8.22	0.03	5.74
	13.97	6/9/2020	12.59	10.50	3.47	9.92	0.58	3.91
	13.97	6/10/2020	12.59	10.57	3.40	9.98	0.59	3.84
	13.97	9/1/2020	12.10	12.06	1.91	10.18	1.88	3.32
	13.97	1/20/2021	11.96	10.98	2.99	9.76	1.22	3.91
	13.97	6/11/2021	17.67	10.06	3.91	9.89	0.17	4.04
	13.97	6/16/2021	17.55	10.25	3.72	9.91	0.34	3.98
	13.97	6/25/2021	17.56	10.60	3.37	10.14	0.46	3.72
	13.97	7/30/2021	17.48	10.09	3.88	9.78	0.31	4.11
	13.97	8/6/2021	NM	9.52	4.45	NA	NA	4.45
	13.97	8/10/2021	NM	9.41	4.56	9.2	0.21	4.72
	13.97	9/14/2021	17.59	9.02	4.95	ND	NA	4.95
	13.97	9/17/2021	NM	8.47	5.50	ND	NA	5.50
	13.97	10/11/2021	17.52	7.21	6.76	ND	NA	6.76
	13.97	10/27/2021	17.54	6.57	7.40	ND	NA	7.40
	13.97	11/10/2021	17.45	5.56	8.41	ND	NA	8.41
	13.97	12/6/2021	17.40	7.11	6.86	ND	NA	6.86
	13.97	12/16/2021	17.31	6.39	7.58	ND	NA	7.58
	13.97	1/10/2022	17.30	6.53	7.44	ND	NA	7.44
	13.97	2/2/2022	17.17	9.09	4.88	ND	NA	4.88
	13.97	3/3/2022	17.40	8.88	5.09	ND	NA	5.09
	13.97	3/7/2022	17.45	7.98	5.99	ND	NA	5.99
	13.97	4/14/2022	17.15	5.64	8.33	ND	NA	8.33
	13.97	5/11/2022	17.18	5.31	8.66	ND	N/A	8.66
	13.97	5/25/2022	17.24	8.26	5.71	ND	NA	5.71
	13.97	6/22/2022	17.18	5.41	8.56	ND	NA	8.56

Table 1
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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-2	**Historical DTW range: 5.2 - 9.8**							
	Historical LNAPL Thickness range: ND to 0.4							
	101.5	3/27/2009	NM	11.04	90.46	9.32	1.72	91.75
	98.29	8/25/2009	NM	10.97	87.32	ND	NA	87.32
	98.29	10/2/2009	NM	6.77	91.52	7.55	0.78	92.11
	98.29	3/27/2010	NM	5.92	92.37	5.59	0.33	92.62
	98.29	4/27/2010	NM	5.67	92.62	5.48	0.19	92.76
	98.29	5/17/2010	NM	6.12	92.17	5.47	0.65	92.66
	98.29	6/28/2010	NM	6.23	92.06	5.52	0.71	92.59
	98.29	7/29/2010	NM	6.08	92.21	5.66	0.42	92.53
	98.29	9/7/2010	NM	6.12	92.17	5.71	0.41	92.48
	94.04	10/6/2010	NM	6.35	87.69	5.66	0.69	88.21
	94.04	11/24/2010	NM	12.77	81.27	ND	NA	81.27
	94.04	1/3/2011	NM	6.90	87.14	5.93	0.97	87.87
	94.04	2/11/2011	NM	6.48	87.56	5.71	0.77	88.14
	94.04	3/9/2011	NM	5.93	88.11	5.4	0.53	88.51
	94.04	4/11/2011	NM	5.82	88.22	5.11	0.71	88.75
	94.04	5/10/2011	NM	6.05	87.99	5.39	0.66	88.49
	94.04	6/15/2011	NM	5.73	88.31	4.9	0.83	88.93
	94.04	7/13/2011	NM	5.77	88.27	4.9	0.87	88.92
	94.04	8/9/2011	NM	5.92	88.12	5.1	0.82	88.74
	94.04	9/8/2011	NM	4.50	89.54	4.5	0.00	89.54
	94.04	9/22/2011	NM	8.49	85.55	8.48	0.01	85.56
	94.04	9/29/2011	NM	4.39	89.65	4.29	0.10	89.73
	94.04	12/14/2011	NM	4.76	89.28	4.62	0.14	89.39
	94.04	12/15/2011	NM	4.42	89.62	4.30	0.12	89.71
	94.04	1/26/2012	NM	6.47	87.57	5.86	0.61	88.03
	94.04	1/27/2012	NM	5.50	88.54	5.07	0.43	88.86
	94.04	2/28/2012	NM	7.70	86.34	6.98	0.72	86.88
	94.04	2/29/2012	NM	6.06	87.98	5.50	0.56	88.40
	94.04	3/26/2012	NM	7.44	86.60	6.16	1.28	87.56
	94.04	3/27/2012	NM	6.76	87.28	5.90	0.86	87.93
	94.04	4/19/2012	NM	10.35	83.69	ND	NA	83.69
	94.04	4/20/2012	NM	6.12	87.92	6.10	0.02	87.94
	94.04	5/24/2012	NM	9.42	84.62	ND	NA	84.62
	94.04	5/25/2012	NM	6.11	87.93	ND	NA	87.93
	94.04	6/7/2012	8.42	NA	NA	ND	NA	NA
	94.04	6/8/2012	NM	6.13	87.91	6.12	0.01	87.92
	94.04	7/18/2012	8.47	NA	NA	ND	NA	NA
	94.04	7/19/2012	NM	6.00	88.04	ND	NA	NA
	94.04	8/15/2012	8.47	NA	NA	ND	NA	NA
	94.04	8/16/2012	NM	6.89	87.15	ND	NA	87.15
	94.04	9/13/2012	8.36	NA	NA	ND	NA	NA
	94.04	9/14/2012	8.40	NA	NA	ND	NA	NA
	94.04	10/25/2012	NM	9.06	84.98	ND	NA	84.98
	94.04	10/26/2012	NM	6.21	87.83	ND	NA	87.83
	94.04	11/28/2012	9.64	6.95	87.09	ND	NA	87.09
	94.04	11/29/2012	NM	6.19	87.85	ND	NA	87.85
	94.04	12/19/2012	9.41	8.35	85.69	ND	NA	85.69
	94.04	12/20/2012	NM	6.31	87.73	ND	NA	87.73
	94.04	1/28/2013	9.60	NA	NA	ND	NA	NA
	94.04	1/29/2013	NM	7.53	86.51	ND	NA	86.51
	94.04	2/25/2013	9.82	6.21	87.83	ND	NA	87.83
	94.04	2/26/2013	NM	8.46	85.58	ND	NA	85.58
	94.04	3/20/2013	9.90	5.68	88.36	ND	NA	88.36
	94.04	3/21/2013	NM	5.71	88.33	ND	NA	88.33

Table 1
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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-2	94.04	4/29/2013	9.99	5.69	88.35	5.67	0.02	88.37
	94.04	4/30/2013	NM	5.72	88.32	5.69	0.03	88.34
	94.04	5/14/2013	9.97	5.62	88.42	5.56	0.06	88.47
	94.04	5/15/2013	NM	5.66	88.38	5.55	0.05	88.42
	94.04	6/17/2013	9.93	5.43	88.61	ND	NA	88.61
	94.04	6/18/2013	NM	8.43	85.61	ND	NA	85.61
	94.04	7/17/2013	9.98	8.89	85.15	ND	NA	85.15
	94.04	7/18/2013	NM	5.65	88.39	ND	NA	88.39
	94.04	8/27/2013	9.95	5.70	88.34	ND	NA	88.34
	94.04	8/28/2013	NM	9.88	84.16	ND	NA	84.16
	94.04	9/23/2013	9.96	9.87	84.17	ND	NA	84.17
	94.04	9/24/2013	NM	9.81	84.23	ND	NA	84.23
	94.04	10/24/2013	9.94	>9.94	NA	ND	NA	NA
	94.04	10/25/2013	NM	6.27	87.77	ND	NA	87.77
	94.04	1/7/2014	9.95	9.91	84.13	ND	NA	84.13
	94.04	1/8/2014	NM	8.32	85.72	8.30	0.02	85.74
	94.04	4/22/2014	9.63	8.73	85.31	ND	NA	85.31
	94.04	4/23/2014	NM	6.05	87.99	ND	NA	87.99
	94.04	7/24/2014	10.55	10.32	83.72	ND	NA	83.72
	94.04	7/25/2014	NM	10.40	83.64	ND	NA	83.64
	94.04	10/13/2014	10.65	10.36	83.68	ND	NA	83.68
	94.04	10/14/2014	NM	10.33	83.71	ND	NA	83.71
	94.04	1/22/2015	10.40	10.28	83.76	ND	NA	83.76
	94.04	1/26/2015	10.40	10.25	83.79	ND	NA	83.79
	94.04	4/28/2015	11.25	6.29	87.75	ND	NA	87.75
	94.04	4/29/2015	11.25	6.31	87.73	ND	NA	87.73
	94.04	7/29/2015	NM	10.26	83.78	ND	NA	83.78
	94.04	7/30/2015	NM	10.20	83.84	ND	NA	83.84
	94.04	10/14/2015	14.10	10.26	83.78	ND	NA	83.78
	94.04	10/15/2015	NM	9.41	84.63	ND	NA	84.63
	94.04	1/20/2016	10.10	9.34	84.70	ND	NA	84.70
	94.04	1/21/2016	NM	6.66	87.38	ND	NA	87.38
	94.04	4/19/2016	10.11	5.83	88.21	ND	NA	88.21
	94.04	4/20/2016	NM	5.93	88.11	ND	NA	88.11
	11.34	7/13/2016	10.25	6.04	5.30	ND	NA	5.30
	11.34	7/14/2016	NM	5.97	5.37	ND	NA	5.37
	11.34	10/25/2016	10.48	10.30	1.04	10.30	Sheen	1.04
	11.34	10/26/2016	NM	10.20	1.14	10.20	Sheen	1.14
	11.34	1/31/2017	10.40	10.19	1.15	10.19	Sheen	1.15
	11.34	2/1/2017	NM	10.21	1.13	10.21	Sheen	1.13
	11.34	4/25/2017	10.23	10.21	1.13	10.21	Sheen	1.13
	11.34	4/26/2017	NM	10.21	1.13	10.21	Sheen	1.13
	11.34	7/24/2017	10.10	5.63	5.71	5.63	Sheen	5.71
	11.34	7/25/2017	NM	5.26	6.08	5.26	Sheen	6.08
	11.34	10/9/2017	10.24	10.15	1.19	10.15	Sheen	1.19
	11.34	10/10/2017	NM	9.74	1.60	9.74	Sheen	1.60
	11.34	2/1/2018	8.81	6.41	4.93	ND	NA	4.93
	11.34	2/2/2018	8.73	6.13	5.21	ND	NA	5.21
	11.34	4/25/2018	10.12	6.03	5.31	ND	Sheen	5.31
	11.34	4/26/2018	10.12	5.92	5.42	6.32	0.40	5.42
	11.34	7/26/2018	10.00	9.80	1.54	9.80	Sheen	1.54
	11.34	7/27/2018	10.00	6.13	5.21	6.13	Sheen	5.21
	11.34	11/5/2018	8.21	6.30	5.04	ND	NA	5.04
	11.34	11/6/2018	8.49	6.15	5.19	ND	NA	5.19
	11.34	6/27/2019	14.35	5.13	6.21	ND	NA	6.21
	11.34	6/28/2019	14.35	7.71	3.63	ND	NA	3.63

Table 1
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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-2	11.34	9/26/2019	14.31	5.56	5.78	5.51	0.05	5.82
	11.34	9/27/2019	14.31	5.81	5.53	ND	NA	5.53
	11.34	12/30/2019	14.06	5.64	5.70	5.57	0.07	5.75
	11.34	12/31/2019	14.05	5.68	5.66	5.62	0.06	5.71
	11.34	6/9/2020	14.42	7.88	3.46	ND	NA	3.46
	11.34	6/10/2020	14.42	7.51	3.83	7.49	0.02	3.85
	11.34	9/1/2020	8.68	7.79	3.55	7.78	0.01	3.56
	11.34	1/20/2021	14.10	8.04	3.30	8.03	0.01	3.31
	11.34	6/11/2021	8.18	6.91	4.43	6.89	0.02	4.45
	11.34	6/16/2021	8.75	6.95	4.39	6.94	0.01	4.40
	11.34	6/23/2021	14.09	7.29	4.05	7.08	0.21	4.21
	11.34	6/25/2021	14.09	7.59	3.75	7.22	0.37	4.03
	11.34	7/30/2021	14.01	7.01	4.33	ND	NA	4.33
	11.34	8/6/2021	NM	7.37	3.97	7.00	0.37	4.25
	11.34	8/10/2021	NM	7.30	4.04	6.94	0.36	4.31
	11.34	9/14/2021	14.10	6.10	5.24	ND	NA	5.24
	11.34	9/17/2021	NM	6.96	4.38	6.27	0.69	4.90
	11.34	10/11/2021	14.06	6.31	5.03	5.92	0.39	5.32
	11.34	10/27/2021	14.16	6.42	4.92	6.09	0.33	5.17
	11.34	11/10/2021	14.11	5.97	5.37	5.97	Sheen	5.37
	11.34	12/6/2021	14.06	6.78	6.23	6.23	0.55	6.64
	11.34	12/16/2021	14.11	6.57	4.77	6.21	0.36	5.04
	11.34	1/10/2022	13.95	6.65	4.69	6.58	0.07	4.74
	11.34	2/2/2022	14.11	7.32	4.02	7.15	0.17	4.15
	11.34	3/3/2022	13.97	6.65	4.69	6.62	0.03	4.71
	11.34	3/7/2022	14.11	5.68	5.66	5.67	0.01	5.67
	11.34	4/14/2022	14.19	6.48	4.86	6.46	0.02	4.88
	11.34	5/11/2022	14.19	6.64	4.70	ND	NA	4.70
	11.34	5/24/2022	14.07	6.41	4.93	ND	NA	4.93
	11.34	6/22/2022	14.19	6.59	4.75	ND	NA	4.75

Table 1
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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-3R	**Historical DTW range: 5.5 - 8.1**							
	Historical LNAPL Thickness range: ND to 0.01							
	11.44	11/5/2018	12.70	6.01	5.43	ND	NA	5.43
	11.44	11/6/2018	13.67	8.90	2.54	ND	NA	2.54
	11.44	6/27/2019	12.61	5.15	6.29	ND	NA	6.29
	11.44	6/28/2019	12.61	6.56	4.88	ND	NA	4.88
	11.44	9/26/2019	12.62	5.44	6.00	5.43	0.01	6.01
	11.44	9/27/2019	12.62	5.64	5.80	ND	NA	5.80
	11.44	12/30/2019	12.62	5.27	6.17	ND	NA	6.17
	11.44	12/31/2019	12.90	5.32	6.12	ND	NA	6.12
	11.44	6/9/2020	12.62	6.97	4.47	ND	NA	4.47
	11.44	6/10/2020	12.62	7.03	4.41	ND	NA	4.41
	11.44	9/1/2020	12.84	8.48	2.96	ND	NA	2.96
	11.44	1/20/2021	12.69	6.37	5.07	6.37	NA	5.07
	11.44	6/11/2021	11.16	5.40	6.04	ND	NA	6.04
	11.44	6/16/2021	11.10	5.33	6.11	ND	NA	6.11
	11.44	6/23/2021	11.14	5.51	5.93	ND	NA	5.93
	11.44	6/25/2021	11.14	5.53	5.91	ND	NA	5.91
	11.44	7/30/2021	NM	5.68	5.76	ND	NA	5.76
	11.44	9/14/2021	11.44	5.53	5.91	ND	NA	5.91
	11.44	9/17/2021	NM	6.91	4.53	ND	NA	4.53
	11.44	10/11/2021	11.40	7.01	4.43	ND	NA	4.43
	11.44	10/27/2021	13.71	6.76	4.68	6.74	0.02	4.70
	11.44	11/10/2021	NM	6.20	5.24	ND	NA	5.24
	11.44	12/6/2021	13.63	7.09	4.35	7.06	0.03	4.37
	11.44	12/16/2021	13.71	6.80	4.64	ND	NA	4.64
	11.44	1/10/2022	NA	6.90	4.54	ND	NA	4.54
	11.44	2/2/2022	NA	5.36	6.08	ND	NA	6.08
	11.44	3/3/2022	NA	5.73	5.71	ND	NA	5.71
	11.44	3/7/2022	NA	4.58	6.86	ND	NA	6.86
	11.44	4/14/2022	NA	4.45	6.99	ND	NA	6.99
	11.44	5/11/2022	NA	4.26	7.18	NA	NA	7.18
	11.44	5/24/2022	NA	4.22	7.22	ND	NA	7.22
	11.44	6/22/2022	NA	5.72	5.72	ND	NA	5.72

Table 1
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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-4	**Historical DTW range: 5.7 - 9.0**							
	Historical LNAPL Thickness range: ND							
	101.4	3/27/2009	NM	9.47	91.93	ND	NA	91.93
	101.4	8/25/2009	NM	8.41	92.99	ND	NA	92.99
	101.4	10/2/2009	NM	8.30	93.10	ND	NA	93.10
	101.4	3/27/2010	16.45	7.70	93.70	ND	NA	93.70
	101.4	4/27/2010	NM	7.62	93.78	ND	NA	93.78
	101.4	5/17/2010	NM	7.64	93.76	ND	NA	93.76
	101.4	6/28/2010	NM	7.78	93.62	ND	NA	93.62
	101.4	7/29/2010	NM	7.85	93.55	ND	NA	93.55
	101.4	9/7/2010	NM	7.92	93.48	ND	NA	93.48
	96.37	10/6/2010	NM	5.87	90.50	ND	NA	90.50
	96.37	11/24/2010	NM	8.31	88.06	ND	NA	88.06
	96.37	1/3/2011	NM	8.30	88.07	ND	NA	88.07
	96.37	2/11/2011	NM	7.99	88.38	ND	NA	88.38
	96.37	3/9/2011	NM	7.54	88.83	ND	NA	88.83
	96.37	4/11/2011	NM	7.39	88.98	ND	NA	88.98
	96.37	5/10/2011	NM	7.46	88.91	ND	NA	88.91
	96.37	6/15/2011	NM	7.40	88.97	ND	NA	88.97
	96.37	7/13/2011	NM	7.40	88.97	ND	NA	88.97
	96.37	8/9/2011	NM	7.39	88.98	ND	NA	88.98
	96.37	9/8/2011	NM	6.59	89.78	ND	NA	89.78
	96.37	9/22/2011	NM	6.84	89.53	ND	NA	89.53
	96.37	9/29/2011	NM	6.71	89.66	ND	NA	89.66
	96.37	12/14/2011	NM	6.93	89.44	ND	NA	89.44
	96.37	12/15/2011	NM	6.70	89.67	ND	NA	89.67
	96.37	1/26/2012	NM	7.57	88.80	ND	NA	88.80
	96.37	1/27/2012	NM	7.25	89.12	ND	NA	89.12
	96.37	2/28/2012	NM	8.04	88.33	ND	NA	88.33
	96.37	2/29/2012	NM	7.80	88.57	ND	NA	88.57
	96.37	3/26/2012	NM	8.75	87.62	ND	NA	87.62
	96.37	3/27/2012	NM	8.24	88.13	ND	NA	88.13
	96.37	4/19/2012	NM	8.35	88.02	ND	NA	88.02
	96.37	4/20/2012	NM	8.35	88.02	ND	NA	88.02
	96.37	5/24/2012	NM	8.22	88.15	ND	NA	88.15
	96.37	5/25/2012	NM	8.11	88.26	ND	NA	88.26
	96.37	6/7/2012	NM	8.17	88.20	ND	NA	88.20
	96.37	6/8/2012	NM	8.13	88.24	ND	NA	88.24
	96.37	7/18/2012	NM	8.30	88.07	ND	NA	88.07
	96.37	7/19/2012	NM	8.06	88.31	ND	NA	88.31
	96.37	8/15/2012	NM	8.15	88.22	ND	NA	88.22
	96.37	8/16/2012	NM	8.09	88.28	ND	NA	88.28
	96.37	9/13/2012	NM	8.30	88.07	ND	NA	88.07
	96.37	9/14/2012	NM	8.31	88.06	ND	NA	88.06
	96.37	10/25/2012	NM	8.38	87.99	ND	NA	87.99
	96.37	10/26/2012	NM	8.31	88.06	ND	NA	88.06
	96.37	11/28/2012	NM	8.43	87.94	ND	NA	87.94
	96.37	11/29/2012	NM	8.42	87.95	ND	NA	87.95
	96.37	12/19/2012	NM	8.44	87.93	ND	NA	87.93
	96.37	12/20/2012	NM	8.45	87.92	ND	NA	87.92
	96.37	1/28/2013	NM	8.29	88.08	ND	NA	88.08
	96.37	1/29/2013	NM	8.41	87.96	ND	NA	87.96
	96.37	2/25/2013	NM	8.25	88.12	ND	NA	88.12
	96.37	2/26/2013	NM	8.22	88.15	ND	NA	88.15
	96.37	3/20/2013	NM	7.84	88.53	ND	NA	88.53
	96.37	3/21/2013	NM	7.78	88.59	ND	NA	88.59

Table 1
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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-4	96.37	4/29/2013	NM	7.91	88.46	ND	NA	88.46
	96.37	4/30/2013	NM	7.95	88.42	ND	NA	88.42
	96.37	5/14/2013	NM	7.63	88.74	ND	NA	88.74
	96.37	5/15/2013	NM	7.66	88.71	ND	NA	88.71
	96.37	6/17/2013	NM	7.51	88.86	ND	NA	88.86
	96.37	6/18/2013	NM	7.53	88.84	ND	NA	88.84
	96.37	7/17/2013	NM	7.83	88.54	ND	NA	88.54
	96.37	7/18/2013	NM	7.76	88.61	ND	NA	88.61
	96.37	8/27/2013	NM	8.01	88.36	ND	NA	88.36
	96.37	8/28/2013	NM	8.05	88.32	ND	NA	88.32
	96.37	9/23/2013	NM	8.15	88.22	ND	NA	88.22
	96.37	9/24/2013	NM	8.05	88.32	ND	NA	88.32
	96.37	10/24/2013	NM	8.46	87.91	ND	NA	87.91
	96.37	10/25/2013	NM	8.49	87.88	ND	NA	87.88
	96.37	1/7/2014	NM	8.45	87.92	ND	NA	87.92
	96.37	1/8/2014	NM	8.52	87.85	ND	NA	87.85
	96.37	4/22/2014	NM	7.99	88.38	ND	NA	88.38
	96.37	4/23/2014	NM	8.15	88.22	ND	NA	88.22
	96.37	7/24/2014	NM	8.69	87.68	ND	NA	87.68
	96.37	7/25/2014	NM	8.78	87.59	ND	NA	87.59
	96.37	10/13/2014	NM	9.48	86.89	ND	NA	86.89
	96.37	10/14/2014	NM	9.45	86.92	ND	NA	86.92
	96.37	1/22/2015	NM	8.92	87.45	ND	NA	87.45
	96.37	1/26/2015	NM	8.89	87.48	ND	NA	87.48
	96.37	4/28/2015	16.38	8.19	88.18	ND	NA	88.18
	96.37	4/29/2015	16.38	8.07	88.30	ND	NA	88.30
	96.37	7/29/2015	NM	8.41	87.96	ND	NA	87.96
	96.37	7/30/2015	NM	8.32	88.05	ND	NA	88.05
	96.37	10/14/2015	16.40	8.33	88.04	ND	NA	88.04
	96.37	10/15/2015	NM	8.44	87.93	ND	NA	87.93
	96.37	1/20/2016	16.40	8.38	87.99	ND	NA	87.99
	96.37	1/21/2016	NM	8.30	88.07	ND	NA	88.07
	96.37	4/19/2016	16.90	8.24	88.13	ND	NA	88.13
	96.37	4/20/2016	NM	8.26	88.11	ND	NA	88.11
	13.59	7/13/2016	16.35	8.19	5.40	ND	NA	5.40
	13.59	7/14/2016	NM	8.13	5.46	ND	NA	5.46
	13.59	10/25/2016	15.96	8.48	5.11	ND	NA	5.11
	13.59	10/26/2016	NM	8.50	5.09	ND	NA	5.09
	NA[3]	1/31/2017	13.95	6.43	NA	ND	NA	NA
	NA[3]	2/1/2017	NM	6.46	NA	ND	NA	NA
	NA[3]	4/25/2017	14.35	5.87	NA	ND	NA	NA
	NA[3]	4/26/2017	NM	5.83	NA	ND	NA	NA
	NA[3]	7/24/2017	14.36	5.34	NA	ND	NA	NA
	NA[3]	7/25/2017	NM	5.38	NA	ND	NA	NA
	NA[3]	10/9/2017	14.35	6.12	NA	ND	NA	NA
	NA[3]	10/10/2017	NM	6.20	NA	ND	NA	NA
	NA[3]	2/1/2018	13.95	6.41	NA	ND	NA	NA
	NA[3]	2/2/2018	13.92	6.60	NA	ND	NA	NA
	NA[3]	4/25/2018	14.00	5.83	NA	ND	NA	NA
	NA[3]	4/26/2018	14.00	5.94	NA	ND	NA	NA
	11.65	7/26/2018	14.00	6.12	5.53	ND	NA	5.53
	11.65	7/27/2018	14.00	6.18	5.47	ND	NA	5.47
	11.65	11/5/2018	14.42	6.13	5.52	ND	NA	5.52
	11.65	11/6/2018	14.41	6.03	5.62	ND	NA	5.62
	11.65	6/27/2019	14.31	4.29	7.36	ND	NA	7.36
	11.65	6/28/2019	14.31	4.40	7.25	ND	NA	7.25

Table 1
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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-4	11.65	9/26/2019	14.37	5.58	6.07	ND	NA	6.07
	11.65	9/27/2019	14.37	5.88	5.77	ND	NA	5.77
	11.65	12/30/2019	14.35	5.71	5.94	ND	NA	5.94
	11.65	12/31/2019	14.33	5.71	5.94	ND	NA	5.94
	11.65	6/9/2020	14.34	7.49	4.16	ND	NA	4.16
	11.65	6/10/2020	14.34	7.55	4.10	ND	NA	4.10
	11.65	9/1/2020	14.08	7.91	3.74	ND	NA	3.74
	11.65	1/20/2021	13.93	7.15	4.50	ND	NA	4.50
	11.65	6/11/2021	12.39	7.04	4.61	ND	NA	4.61
	11.65	6/23/2021	13.93	7.29	4.36	ND	NA	4.36
	11.65	6/25/2021	13.93	7.24	4.41	ND	NA	4.41
	11.65	7/30/2021	14.34	7.07	4.58	ND	NA	4.58
	11.65	8/6/2021	NM	7.06	4.59	ND	NA	4.59
	11.65	8/10/2021	NM	7.01	4.64	ND	NA	4.64
	11.65	9/14/2021	14.43	6.04	5.61	ND	NA	5.61
	11.65	9/17/2021	NM	6.16	5.49	ND	NA	5.49
	11.65	10/11/2021	13.91	6.06	5.59	ND	NA	5.59
	11.65	10/27/2021	13.48	5.96	5.69	ND	NA	5.69
	11.65	11/10/2021	13.95	5.89	5.76	ND	NA	5.76
	11.65	12/6/2021	14.32	5.92	5.73	ND	NA	5.73
	11.65	12/16/2021	14.40	6.06	5.59	ND	NA	5.59
	11.65	1/10/2022	NM	6.33	5.32	ND	NA	5.32
	11.65	2/2/2022	14.36	6.43	5.22	ND	NA	5.22
	11.65	3/3/2022	14.32	6.20	5.45	ND	NA	5.45
	11.65	3/7/2022	14.35	6.10	5.55	ND	NA	5.55
	11.65	4/14/2022	13.95	5.60	6.05	ND	NA	6.05
	11.65	5/11/2022	13.95	5.39	6.26	ND	NA	6.26
	11.65	5/24/2022	14.39	5.15	6.50	ND	NA	6.50
	11.65	6/22/2022	13.95	5.19	6.46	ND	NA	6.46

Table 1
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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-5	**Historical DTW range: 5.3 - 6.4**							
	Historical LNAPL Thickness range: ND							
	100.72	3/27/2009	NM	8.68	92.04	ND	NA	92.04
	100.72	8/25/2009	NM	7.53	93.19	ND	NA	93.19
	100.72	10/2/2009	NM	7.32	93.40	ND	NA	93.40
	100.72	3/27/2010	13.05	5.67	95.05	ND	NA	95.05
	100.72	4/27/2010	NM	5.54	95.18	ND	NA	95.18
	100.72	5/17/2010	NM	5.52	95.20	ND	NA	95.20
	100.72	6/28/2010	NM	5.63	95.09	ND	NA	95.09
	100.72	7/29/2010	NM	5.63	95.09	ND	NA	95.09
	100.72	9/7/2010	NM	5.69	95.03	ND	NA	95.03
	94.11	10/6/2010	NM	5.87	88.24	ND	NA	88.24
	94.11	11/24/2010	NM	6.03	88.08	ND	NA	88.08
	94.11	1/3/2011	NM	6.11	88.00	ND	NA	88.00
	94.11	2/11/2011	NM	6.11	88.00	ND	NA	88.00
	94.11	3/9/2011	NM	5.50	88.61	ND	NA	88.61
	94.11	4/11/2011	NM	5.19	88.92	ND	NA	88.92
	94.11	5/10/2011	NM	5.34	88.77	ND	NA	88.77
	94.11	6/15/2011	NM	5.20	88.91	ND	NA	88.91
	94.11	7/13/2011	NM	5.20	88.91	ND	NA	88.91
	94.11	8/9/2011	NM	5.24	88.87	ND	NA	88.87
	94.11	9/8/2011	NM	4.44	89.67	ND	NA	89.67
	94.11	9/22/2011	NM	4.56	89.55	ND	NA	89.55
	94.11	9/29/2011	NM	5.24	88.87	ND	NA	88.87
	94.11	12/14/2011	12.95	4.59	89.52	ND	NA	89.52
	94.11	12/15/2011	12.95	4.39	89.72	ND	NA	89.72
	94.11	1/26/2012	NM	5.27	88.84	ND	NA	88.84
	94.11	1/27/2012	NM	5.46	88.65	ND	NA	88.65
	94.11	2/28/2012	NM	5.72	88.39	ND	NA	88.39
	94.11	2/29/2012	NM	5.55	88.56	ND	NA	88.56
	94.11	3/26/2012	NM	6.00	88.11	ND	NA	88.11
	94.11	3/27/2012	NM	5.95	88.16	ND	NA	88.16
	94.11	4/19/2012	NM	6.09	88.02	ND	NA	88.02
	94.11	4/20/2012	NM	6.07	88.04	ND	NA	88.04
	94.11	5/24/2012	12.98	6.12	87.99	ND	NA	87.99
	94.11	5/25/2012	NM	6.07	88.04	ND	NA	88.04
	94.11	6/7/2012	12.99	6.14	87.97	ND	NA	87.97
	94.11	6/8/2012	NM	6.03	88.08	ND	NA	88.08
	94.11	7/18/2012	12.97	6.07	88.04	ND	NA	88.04
	94.11	7/19/2012	NM	6.01	88.10	ND	NA	88.10
	94.11	8/15/2012	13.02	5.96	88.15	ND	NA	88.15
	94.11	8/16/2012	NM	8.50	85.61	ND	NA	85.61
	94.11	9/13/2012	12.98	6.09	88.02	ND	NA	88.02
	94.11	9/14/2012	13.05	6.11	88.00	ND	NA	88.00
	94.11	10/25/2012	12.99	6.24	87.87	ND	NA	87.87
	94.11	10/26/2012	NM	6.17	87.94	ND	NA	87.94
	94.11	11/28/2012	12.98	6.30	87.81	ND	NA	87.81
	94.11	11/29/2012	NM	6.22	87.89	ND	NA	87.89
	94.11	12/19/2012	13.00	6.32	87.79	ND	NA	87.79
	94.11	12/20/2012	NM	6.31	87.80	ND	NA	87.80
	94.11	1/28/2013	13.04	6.16	87.95	ND	NA	87.95
	94.11	1/29/2013	NM	6.26	87.85	ND	NA	87.85
	94.11	2/25/2013	10.96	6.19	87.92	ND	NA	87.92
	94.11	2/26/2013	NM	6.14	87.97	ND	NA	87.97
	94.11	3/20/2013	13.03	5.69	88.42	ND	NA	88.42
	94.11	3/21/2013	NM	5.69	88.42	ND	NA	88.42

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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-5	94.11	4/29/2013	13.00	5.63	88.48	ND	NA	88.48
	94.11	4/30/2013	NM	5.63	88.48	ND	NA	88.48
	94.11	5/14/2013	13.00	5.62	88.49	ND	NA	88.49
	94.11	5/15/2013	NM	5.63	88.48	ND	NA	88.48
	94.11	6/17/2013	12.99	5.44	88.67	ND	NA	88.67
	94.11	6/18/2013	NM	5.49	88.62	ND	NA	88.62
	94.11	7/17/2013	13.01	5.66	88.45	ND	NA	88.45
	94.11	7/18/2013	NM	5.56	88.55	ND	NA	88.55
	94.11	8/27/2013	12.91	5.82	88.29	ND	NA	88.29
	94.11	8/28/2013	NM	5.86	88.25	ND	NA	88.25
	94.11	9/23/2013	12.99	6.02	88.09	ND	NA	88.09
	94.11	9/24/2013	NM	5.98	88.13	ND	NA	88.13
	94.11	10/24/2013	13.00	6.21	87.90	ND	NA	87.90
	94.11	10/25/2013	NM	6.30	87.81	ND	NA	87.81
	94.11	1/7/2014	12.97	6.36	87.75	ND	NA	87.75
	94.11	1/8/2014	NM	6.42	87.69	ND	NA	87.69
	94.11	4/22/2014	13.05	6.00	88.11	ND	NA	88.11
	94.11	4/23/2014	NM	6.09	88.02	ND	NA	88.02
	94.11	7/24/2014	13.05	6.66	87.45	ND	NA	87.45
	94.11	7/25/2014	NM	6.68	87.43	ND	NA	87.43
	94.11	10/13/2014	13.03	7.42	86.69	ND	NA	86.69
	94.11	10/14/2014	NM	8.38	85.73	ND	NA	85.73
	94.11	1/22/2015	12.66	6.99	87.12	ND	NA	87.12
	94.11	1/26/2015	12.66	6.99	87.12	ND	NA	87.12
	94.11	4/28/2015	12.99	6.30	87.81	ND	NA	87.81
	94.11	4/29/2015	12.99	6.23	87.88	ND	NA	87.88
	94.11	7/29/2015	NM	6.23	87.88	6.22	0.01	87.89
	94.11	7/30/2015	NM	6.22	87.89	6.23	0.01	87.90
	94.11	10/14/2015	13.04	6.29	87.82	ND	NA	87.82
	94.11	10/15/2015	NM	6.28	87.83	ND	NA	87.83
	94.11	1/20/2016	13.00	6.29	87.82	ND	NA	87.82
	94.11	1/21/2016	NM	6.30	87.81	ND	NA	87.81
	94.11	4/19/2016	12.94	5.97	88.14	ND	NA	88.14
	94.11	4/20/2016	NM	6.05	88.06	ND	NA	88.06
	11.39	7/13/2016	13.08	6.00	5.39	ND	NA	5.39
	11.39	7/14/2016	NM	5.99	5.40	ND	NA	5.40
	11.39	10/25/2016	13.10	6.26	5.13	ND	NA	5.13
	11.39	10/26/2016	NM	6.30	5.09	ND	NA	5.09
	11.39	1/31/2017	12.85	6.29	5.10	ND	NA	5.10
	11.39	2/1/2017	NM	6.30	5.09	ND	NA	5.09
	11.39	4/25/2017	12.97	5.66	5.73	ND	NA	5.73
	11.39	4/26/2017	NM	5.67	5.72	ND	NA	5.72
	11.39	7/24/2017	13.10	5.23	6.16	ND	NA	6.16
	11.39	7/25/2017	NM	5.26	6.13	ND	NA	6.13
	11.39	10/9/2017	12.70	5.91	5.48	ND	NA	5.48
	11.39	10/10/2017	NM	5.95	5.44	ND	NA	5.44
	11.39	2/1/2018	12.79	6.49	4.90	ND	NA	4.90
	11.39	2/2/2018	12.71	6.43	4.96	ND	NA	4.96
	11.39	4/25/2018	12.72	5.81	5.58	ND	NA	5.58
	11.39	4/26/2018	12.72	5.89	5.50	ND	NA	5.50
	11.39	7/26/2018	12.72	6.13	5.26	ND	NA	5.26
	11.39	7/27/2018	12.72	6.12	5.27	ND	NA	5.27
	11.39	11/5/2018	13.08	6.10	5.29	ND	NA	5.29
	11.39	11/6/2018	13.07	5.98	5.41	ND	NA	5.41
	11.39	6/27/2019	13.04	5.19	6.20	ND	NA	6.20
	11.39	6/28/2019	13.04	5.24	6.15	ND	NA	6.15

Table 1
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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-5	11.39	9/26/2019	13.03	5.49	5.90	ND	NA	5.90
	11.39	9/27/2019	13.03	5.62	5.77	ND	NA	5.77
	11.39	12/30/2019	13.51	5.57	5.82	ND	NA	5.82
	11.39	12/31/2019	13.54	5.61	5.78	ND	NA	5.78
	11.39	6/9/2020	12.84	7.42	3.97	ND	NA	3.97
	11.39	9/1/2020	12.88	7.91	3.48	ND	NA	3.48
	11.39	6/10/2020	12.84	7.49	3.90	ND	NA	3.90
	11.39	1/20/2021	12.96	7.10	4.29	ND	NA	4.29
	11.39	6/11/2021	13.00	6.99	4.40	ND	NA	4.40
	11.39	6/16/2021	12.73	7.07	4.32	ND	NA	4.32
	11.39	6/23/2021	12.95	7.20	4.19	ND	NA	4.19
	11.39	6/25/2021	NM	7.19	4.20	ND	NA	4.20
	11.39	7/30/2021	13.00	7.09	4.30	ND	NA	4.30
	11.39	8/6/2021	NM	7.08	4.31	ND	NA	4.31
	11.39	8/10/2021	NM	7.03	4.36	ND	NA	4.36
	11.39	9/14/2021	12.99	6.10	5.29	ND	NA	5.29
	11.39	9/17/2021	NM	6.20	5.19	ND	NA	5.19
	11.39	10/27/2021	12.71	5.97	5.42	ND	NA	5.42
	11.39	11/10/2021	12.98	5.92	5.47	ND	NA	5.47
	11.39	12/6/2021	12.69	6.03	5.36	ND	NA	5.36
	11.39	12/16/2021	12.74	6.08	5.31	ND	NA	5.31
	11.39	1/10/2022	NM	6.26	5.13	ND	NA	5.13
	11.39	2/2/2022	12.72	6.33	5.06	ND	NA	5.06
	11.39	3/3/2022	12.70	5.99	5.40	ND	NA	5.40
	11.39	3/7/2022	12.71	5.88	5.51	ND	NA	5.51
	11.39	4/14/2022	12.68	5.80	5.59	ND	NA	5.59
	11.39	5/11/2022	12.68	5.60	5.79	ND	NA	5.79
	11.39	5/24/2022	12.75	5.50	5.89	ND	NA	5.89
	11.39	6/22/2022	12.68	5.63	5.76	ND	NA	5.76

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-6 (IW-08)	**Historical DTW range: 5.8 - 8.0**							
	Historical LNAPL Thickness range: ND - 0.2							
	100.16	3/27/2009	NM	8.74	91.42	8.05	0.69	91.94
	100.16	8/25/2009	NM	6.83	93.33	ND	NA	93.33
	100.16	10/2/2009	NM	6.56	93.60	6.97	-0.41	93.29
	100.16	3/27/2010	NM	7.13	93.03	5.5	1.63	94.25
	100.16	4/27/2010	NM	7.06	93.10	5.54	1.52	94.24
	100.16	5/17/2010	NM	6.68	93.48	5.32	1.36	94.50
	100.16	6/28/2010	NM	6.99	93.17	5.47	1.52	94.31
	100.16	7/29/2010	NM	6.94	93.22	5.59	1.35	94.23
	100.16	9/7/2010	NM	6.92	93.24	5.68	1.24	94.17
	94.06	10/6/2010	NM	7.01	87.05	5.69	1.32	88.04
	94.06	11/24/2010	NM	7.02	87.04	5.52	1.50	88.17
	94.06	1/3/2011	NM	6.94	87.12	5.93	1.01	87.88
	94.06	2/11/2011	NM	6.72	87.34	5.71	1.01	88.10
	94.06	3/9/2011	NM	6.56	87.50	5.38	1.18	88.39
	94.06	4/11/2011	NM	5.72	88.34	5.11	0.61	88.80
	94.06	5/10/2011	NM	5.82	88.24	5.3	0.52	88.63
	94.06	6/15/2011	NM	5.45	88.61	5	0.45	88.95
	94.06	7/13/2011	NM	5.44	88.62	5.02	0.42	88.94
	94.06	8/9/2011	NM	5.76	88.30	5.17	0.59	88.74
	94.06	9/8/2011	NM	4.57	89.49	ND	NA	89.49
	94.06	9/22/2011	NM	4.74	89.32	4.39	0.35	89.58
	94.06	9/29/2011	NM	4.35	89.71	ND	NA	89.71
	94.06	12/14/2011	12.59	7.60	86.46	7.00	0.60	86.46
	94.06	12/15/2011	12.59	4.38	89.68	4.21	0.17	89.68
	94.06	1/26/2012	NM	5.63	88.43	5.36	0.27	88.43
	94.06	1/27/2012	NM	5.41	88.65	5.12	0.29	88.65
	94.06	2/28/2012	NM	8.35	85.71	ND	NA	85.71
	94.06	2/29/2012	NM	5.59	88.47	ND	NA	88.47
	94.06	3/26/2012	NM	8.43	85.63	ND	NA	85.63
	94.06	3/27/2012	NM	6.03	88.03	ND	NA	88.03
	94.06	4/19/2012	NM	6.20	87.86	ND	NA	87.86
	94.06	4/20/2012	NM	6.15	87.91	ND	NA	87.91
	94.06	5/24/2012	NM	NM	NA	NM	NA	NA
	94.06	5/25/2012	NM	6.00	88.06	5.98	0.02	88.06
	94.06	6/7/2012	11.42	8.38	85.68	ND	NA	85.68
	94.06	6/8/2012	NM	6.05	88.01	ND	NA	88.01
	94.06	7/18/2012	12.73	8.43	85.63	ND	NA	85.63
	94.06	7/19/2012	NM	6.08	87.98	ND	NA	87.98
	94.06	8/15/2012	11.46	6.04	88.02	ND	NA	88.02
	94.06	8/16/2012	NM	8.79	85.27	ND	NA	85.27
	94.06	9/13/2012	11.44	6.12	87.94	ND	NA	87.94
	94.06	9/14/2012	11.41	6.15	87.91	ND	NA	87.91
	94.06	10/25/2012	NM	8.19	85.87	ND	NA	85.87
	94.06	10/26/2012	NM	6.21	87.85	ND	NA	87.85
	94.06	11/28/2012	11.47	8.28	85.78	ND	NA	85.78
	94.06	11/29/2012	NM	6.26	87.80	ND	NA	87.80
	94.06	12/19/2012	12.13	6.51	87.55	ND	NA	87.55
	94.06	12/20/2012	NM	6.28	87.78	ND	NA	87.78
	94.06	1/28/2013	12.91	6.20	87.86	ND	NA	87.86
	94.06	1/29/2013	NM	6.39	87.67	ND	NA	87.67
	94.06	2/25/2013	11.48	6.12	87.94	ND	NA	87.94
	94.06	2/26/2013	NM	6.19	87.87	ND	NA	87.87
	94.06	3/20/2013	11.50	5.66	88.40	ND	NA	88.40
	94.06	3/21/2013	NM	5.62	88.44	ND	NA	88.44

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-6 (IW-08)	94.06	4/29/2013	11.44	5.70	88.36	5.62	0.08	88.36
	94.06	4/30/2013	NM	5.74	88.32	5.62	0.12	88.32
	94.06	5/14/2013	11.41	5.53	88.53	ND	NA	88.53
	94.06	5/15/2013	NM	5.55	88.51	ND	NA	88.51
	94.06	6/17/2013	11.45	5.53	88.53	5.41	0.12	88.62
	94.06	6/18/2013	NM	5.68	88.38	5.47	0.21	88.54
	94.06	7/17/2013	11.47	5.82	88.24	5.70	0.12	88.33
	94.06	7/18/2013	NM	5.70	88.36	5.51	0.19	88.50
	94.06	8/27/2013	11.46	5.82	88.24	5.75	0.07	88.29
	94.06	8/28/2013	NM	7.03	87.03	6.91	0.12	87.12
	94.06	9/23/2013	11.45	6.29	87.77	6.04	0.25	87.96
	94.06	9/24/2013	NM	6.23	87.83	5.96	0.27	88.03
	94.06	10/24/2013	11.47	6.49	87.57	6.38	0.11	87.65
	94.06	10/25/2013	NM	6.40	87.66	6.17	0.23	87.83
	94.06	1/7/2014	11.48	6.35	87.71	ND	NA	87.71
	94.06	1/8/2014	NM	6.42	87.64	6.61	0.19	87.78
	94.06	4/22/2014	11.38	5.99	88.07	ND	NA	88.07
	94.06	4/23/2014	NM	6.10	87.96	ND	NA	87.96
	94.06	7/24/2014	12.80	6.62	87.44	6.61	0.01	87.45
	94.06	7/25/2014	NM	6.78	87.28	6.75	0.03	87.30
	94.06	10/13/2014	12.90	8.26	85.80	8.25	0.01	85.81
	94.06	10/14/2014	NM	8.40	85.66	ND	NA	85.66
	94.06	1/22/2015	9.14	8.40	85.66	ND	NA	85.66
	94.06	1/26/2015	9.14	8.35	85.71	ND	NA	85.71
	94.06	4/28/2015	6.60	6.30	87.76	6.25	0.05	87.80
	94.06	4/29/2015	6.60	6.28	87.78	6.22	0.06	87.83
	94.06	7/29/2015	NM	6.15	87.91	6.10	0.05	87.95
	94.06	7/30/2015	NM	6.18	87.88	6.13	0.05	87.92
	94.06	10/14/2015	NM	6.27	87.79	6.20	0.07	87.84
	94.06	10/15/2015	NM	6.33	87.73	6.25	0.08	87.79
	94.06	1/20/2016	7.14	6.35	87.71	ND	NA	87.71
	94.06	1/21/2016	NM	6.41	87.65	6.31	0.10	87.73
	94.06	4/19/2016	7.13	5.81	88.25	ND	NA	88.25
	94.06	4/20/2016	NM	6.51	87.55	5.87	0.64	88.03
	11.38	7/13/2016	8.60	5.98	5.40	5.94	0.04	5.40
	11.38	7/14/2016	NM	5.87	5.51	5.88	0.01	5.52
	11.38	10/25/2016	8.59	6.13	5.25	6.12	0.01	5.26
	11.38	10/26/2016	NM	6.53	4.85	6.13	0.40	5.15
	11.38	1/31/2017	8.61	6.57	4.81	6.27	0.30	5.04
	11.38	2/1/2017	NM	6.27	5.11	6.27	Sheen	5.11
	11.38	4/25/2017	8.40	5.65	5.73	6.27	Sheen	5.73
	11.38	4/26/2017	NM	5.66	5.72	6.27	Sheen	5.72
	11.38	7/24/2017	8.41	5.16	6.22	5.16	Sheen	6.22
	11.38	7/25/2017	NM	5.21	6.17	5.21	Sheen	6.17
	11.38	10/9/2017	8.40	5.91	5.47	5.91	Sheen	5.47
	11.38	10/10/2017	NM	5.96	5.42	5.96	Sheen	5.42
	11.38	2/1/2018	NM	6.50	4.88	6.40	0.10	4.96
	11.38	2/2/2018	8.04	6.49	4.89	6.38	0.11	4.97
	11.38	4/25/2018	12.14	5.82	5.56	ND	NA	5.56
	11.38	4/26/2018	12.14	6.02	5.36	5.83	0.19	5.50
	11.38	7/26/2018	12.12	6.33	5.05	6.30	0.03	5.07
	11.38	7/27/2018	12.12	6.18	5.20	6.13	0.05	5.24
	11.38	11/5/2018	7.40	6.00	5.38	ND	NA	5.38
	11.38	11/6/2018	7.30	6.01	5.37	6.01	Sheen	5.37
	11.38	6/27/2019	12.77	5.54	5.84	5.12	0.42	6.16
	11.38	6/28/2019	12.77	7.44	3.94	7.40	0.04	3.97

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-6 (IW-08)	11.38	9/26/2019	12.78	5.72	5.66	5.53	0.19	5.80
	11.38	9/27/2019	12.78	6.04	5.34	5.79	0.25	5.53
	11.38	12/30/2019	12.90	5.65	5.73	5.62	0.03	5.75
	11.38	12/31/2019	12.92	5.68	5.70	5.63	0.05	5.74
	11.38	6/9/2020	12.80	7.51	3.87	7.51	Sheen	3.87
	11.38	6/10/2020	12.80	7.51	3.87	7.50	0.01	3.88
	11.38	9/1/2020	8.30	8.03	3.35	7.89	0.14	3.46
	11.38	1/20/2021	12.80	7.28	4.10	7.27	0.01	4.11
	11.38	6/11/2021	12.80	6.66	4.72	6.65	0.01	4.73
	11.38	6/16/2021	14.11	6.86	4.52	ND	NA	4.52
	11.38	6/23/2021	12.20	6.90	4.48	ND	NA	4.48
	11.38	6/25/2021	NM	6.90	4.48	6.88	0.02	4.50
	11.38	7/30/2021	12.34	6.81	4.57	ND	NA	4.57
	11.38	8/10/2021	NM	6.78	4.60	ND	NA	4.60
	11.38	9/14/2021	12.13	5.77	5.61	ND	NA	5.61
	11.38	9/17/2021	NM	5.11	6.27	ND	NA	6.27
	11.38	10/11/2021	12.13	5.26	6.12	ND	NA	6.12
	11.38	10/27/2021	12.16	5.69	5.69	ND	NA	5.69
	11.38	11/10/2021	12.25	5.78	5.60	ND	NA	5.60
	11.38	12/6/2021	12.19	5.08	6.30	ND	NA	6.30
	11.38	12/16/2021	12.20	5.88	5.50	ND	NA	5.50
	11.38	1/10/2022	NM	4.80	6.58	ND	NA	6.58
	11.38	2/2/2022	12.11	5.72	5.66	ND	NA	5.66
	11.38	3/3/2022	12.10	5.84	5.54	ND	NA	5.54
	11.38	3/7/2022	12.09	5.72	5.66	ND	NA	5.66
	11.38	4/14/2022	12.20	5.73	5.65	ND	NA	5.65
	11.38	5/11/2022	12.20	5.49	5.89	ND	NA	5.89
	11.38	5/24/2022	12.00	5.31	6.07	ND	NA	6.07
	11.38	6/22/2022	12.20	5.32	6.06	ND	NA	6.06

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-7	**Historical DTW range: 5.4 - 7.8**							
	Historical LNAPL Thickness range: ND - 0.37							
	11.38	8/25/2009	NM	10.92	0.46	ND	NA	0.46
	98.08	10/2/2009	NM	7.13	90.95	7.09	0.04	90.98
	98.08	3/27/2010	NM	5.73	92.35	ND	NA	92.35
	98.08	4/27/2010	NM	5.60	92.48	ND	NA	92.48
	98.08	5/17/2010	NM	5.38	92.70	ND	NA	92.70
	98.08	6/28/2010	NM	5.60	92.48	ND	NA	92.48
	98.08	7/29/2010	NM	5.72	92.36	ND	NA	92.36
	98.08	9/7/2010	NM	5.73	92.35	ND	NA	92.35
	93.95	10/6/2010	NM	6.71	87.24	ND	NA	87.24
	93.95	11/24/2010	NM	12.96	80.99	ND	NA	80.99
	93.95	1/3/2011	NM	7.63	86.32	ND	NA	86.32
	93.95	2/11/2011	NM	5.62	88.33	ND	NA	88.33
	93.95	3/9/2011	NM	5.50	88.45	ND	NA	88.45
	93.95	4/11/2011	NM	5.24	88.71	ND	NA	88.71
	93.95	5/10/2011	NM	5.37	88.58	ND	NA	88.58
	93.95	6/15/2011	NM	5.19	88.76	ND	NA	88.76
	93.95	7/13/2011	NM	5.21	88.74	ND	NA	88.74
	93.95	8/9/2011	NM	5.19	88.76	ND	NA	88.76
	93.95	9/8/2011	NM	4.61	89.34	ND	NA	89.34
	93.95	9/22/2011	NM	9.94	84.01	ND	NA	84.01
	93.95	9/29/2011	NM	7.23	86.72	ND	NA	86.72
	93.95	12/14/2011	NM	5.65	88.30	ND	NA	88.30
	93.35	12/15/2011	NM	4.49	88.86	ND	NA	88.86
	93.35	1/26/2012	NM	9.98	83.37	ND	NA	83.37
	93.35	1/27/2012	NM	8.62	84.73	ND	NA	84.73
	93.35	2/28/2012	NM	6.72	86.63	ND	NA	86.63
	93.35	2/29/2012	NM	5.61	87.74	ND	NA	87.74
	93.35	3/26/2012	NM	9.95	83.4	ND	NA	83.4
	93.35	3/27/2012	NM	6.07	87.28	ND	NA	87.28
	93.35	4/19/2012	NM	6.08	87.27	ND	NA	87.27
	93.35	4/20/2012	NM	6.07	87.28	ND	NA	87.28
	93.35	5/24/2012	10.78	6.19	87.16	ND	NA	87.16
	93.35	5/25/2012	NM	6.01	87.34	ND	NA	87.34
	93.35	6/7/2012	10.82	6.11	87.24	ND	NA	87.24
	93.35	6/8/2012	NM	6.08	87.27	ND	NA	87.27
	93.35	7/18/2012	NM	6.05	87.3	ND	NA	87.3
	93.35	7/19/2012	NM	5.98	87.37	ND	NA	87.37
	93.35	8/15/2012	8.86	5.92	87.43	ND	NA	87.43
	93.35	8/16/2012	NM	5.81	87.54	ND	NA	87.54
	93.35	9/13/2012	11.92	6.14	87.21	ND	NA	87.21
	93.35	9/14/2012	11.9	6.11	87.24	6.10	0.01	87.24
	93.35	10/25/2012	NM	6.26	87.09	ND	NA	87.09
	93.35	10/26/2012	NM	6.17	87.18	ND	NA	87.18
	93.35	11/28/2012	8.92	6.18	87.17	ND	NA	87.17
	93.35	11/29/2012	NM	6.12	87.23	ND	NA	87.23
	93.35	12/19/2012	8.74	NA	NA	ND	NA	NA
	93.35	12/20/2012	NM	6.26	87.09	ND	NA	87.09
	93.35	1/28/2013	8.94	NA	NA	ND	NA	NA
	93.35	1/29/2013	NM	NA	NA	ND	NA	NA
	93.35	2/25/2013	8.73	6.18	87.17	ND	NA	87.17
	93.35	2/26/2013	NM	6.09	87.26	ND	NA	87.26
	93.35	3/20/2013	8.66	5.72	87.63	ND	NA	87.63
	93.35	3/21/2013	NM	5.69	87.66	ND	NA	87.66
	93.35	4/29/2013	8.73	5.64	87.71	ND	NA	87.71

Table 1
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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-7	93.35	4/30/2013	NM	5.63	87.72	ND	NA	87.72
	93.35	5/14/2013	8.74	5.67	87.68	ND	NA	87.68
	93.35	5/15/2013	NM	5.67	87.68	ND	NA	87.68
	93.35	6/17/2013	8.69	5.40	87.95	ND	NA	87.95
	93.35	6/18/2013	NM	5.52	87.83	ND	NA	87.83
	93.35	7/17/2013	8.76	5.63	87.72	ND	NA	87.72
	93.35	7/18/2013	NM	5.57	87.78	ND	NA	87.78
	93.35	8/27/2013	8.76	5.84	87.51	ND	NA	87.51
	93.35	8/28/2013	NM	5.96	87.39	ND	NA	87.39
	93.35	9/23/2013	8.73	6.03	87.32	ND	NA	87.32
	93.35	9/24/2013	NM	5.95	87.4	ND	NA	87.4
	93.35	10/24/2013	8.75	6.21	87.14	ND	NA	87.14
	93.35	10/25/2013	NM	6.26	87.09	ND	NA	87.09
	93.35	1/7/2014	8.81	6.47	86.88	ND	NA	86.88
	93.35	1/8/2014	NM	6.58	86.77	ND	NA	86.77
	93.35	4/22/2014	8.8	5.95	87.4	ND	NA	87.4
	93.35	4/23/2014	NM	6.04	87.31	ND	NA	87.31
	93.35	7/24/2014	14.13	6.56	86.79	ND	NA	86.79
	93.35	7/25/2014	NM	6.85	86.5	ND	NA	86.5
	93.35	10/13/2014	8.74	7.43	85.92	ND	NA	85.92
	93.35	10/14/2014	NM	7.42	85.93	ND	NA	85.93
	93.35	1/22/2015	10.66	6.83	86.52	ND	NA	86.52
	93.35	1/26/2015	10.66	6.75	86.6	ND	NA	86.6
	93.35	4/28/2015	14.11	6.25	87.1	ND	NA	87.1
	93.35	4/29/2015	14.11	6.2	87.15	ND	NA	87.15
	93.35	7/29/2015	NM	6.25	87.1	ND	NA	87.1
	93.35	7/30/2015	NM	6.14	87.21	ND	NA	87.21
	93.35	10/14/2015	13.97	6.25	87.1	ND	NA	87.1
	93.35	10/15/2015	NM	6.31	87.04	ND	NA	87.04
	93.35	1/20/2016	11.9	6.2	87.15	ND	NA	87.15
	93.35	1/21/2016	NM	6.17	87.18	ND	NA	87.18
	93.35	4/19/2016	14.01	5.93	87.42	ND	NA	87.42
	93.35	4/20/2016	NM	5.98	87.37	ND	NA	87.37
	11.24	7/13/2016	14.11	5.98	5.26	ND	NA	5.26
	11.24	7/14/2016	NM	5.9	5.34	ND	NA	5.34
	11.24	10/25/2016	14.18	6.3	4.94	ND	NA	4.94
	11.24	10/26/2016	NM	6.28	4.96	ND	NA	4.96
	11.24	1/31/2017	14.17	6.34	4.9	ND	NA	4.9
	11.24	2/1/2017	NM	6.4	4.84	ND	NA	4.84
	11.24	4/25/2017	14.06	5.71	5.53	ND	NA	5.53
	11.24	4/26/2017	NM	5.67	5.57	ND	NA	5.57
	11.24	7/24/2017	14.2	5.32	5.92	ND	NA	5.92
	11.24	7/25/2017	NM	5.4	5.84	ND	NA	5.84
	11.24	10/9/2017	14.1	5.98	5.26	ND	NA	5.26
	11.24	10/10/2017	NM	6.11	5.13	ND	NA	5.13
	11.24	2/1/2018	14.07	6.31	4.93	ND	NA	4.93
	11.24	2/2/2018	14.2	6.43	4.81	ND	NA	4.81
	11.24	4/24/2018	14.2	5.67	5.57	ND	NA	5.57
	11.24	4/25/2018	14.2	5.88	5.36	ND	NA	5.36
	11.24	7/26/2018	14.21	6.06	5.18	ND	NA	5.18
	11.24	7/27/2018	14.21	6.12	5.12	ND	NA	5.12
	11.24	11/5/2018	14.2	6.05	5.19	ND	NA	5.19
	11.24	11/6/2018	14.15	5.9	5.34	ND	NA	5.34
	11.24	6/27/2019	14.00	5.13	6.11	ND	NA	6.11
	11.24	6/28/2019	14.00	5.24	6.00	5.22	0.02	6.02
	11.24	9/26/2019	14.07	5.46	5.78	5.44	0.02	5.80

Table 1
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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-7	11.24	9/27/2019	14.07	5.77	5.47	5.71	0.06	5.52
	11.24	12/30/2019	14.11	5.47	5.77	5.46	0.01	5.78
	11.24	12/31/2019	14.13	5.54	5.70	5.53	0.01	5.71
	11.24	6/9/2020	14.08	7.33	3.91	ND	NA	3.91
	11.24	6/10/2020	14.08	7.43	3.81	ND	NA	3.81
	11.24	9/1/2020	14.08	7.79	3.45	ND	NA	3.45
	11.24	1/20/2021	14.04	7.29	3.95	6.92	0.37	4.23
	11.24	6/11/2021	14.05	6.92	4.32	6.81	0.11	4.40
	11.24	6/23/2021	14.11	7.74	3.50	7.64	0.10	3.58
	11.24	6/25/2021	NM	7.62	3.62	7.62	Sheen	3.62
	11.24	7/30/2021	14.05	7.26	3.98	ND	NA	3.98
	11.24	8/6/2021	NM	7.00	4.24	7.00	Sheen	4.24
	11.24	8/10/2021	NM	6.98	4.26	ND	NA	4.26
	11.24	9/14/2021	14.14	6.11	5.13	ND	NA	5.13
	11.24	9/17/2021	NM	7.00	4.24	7.00	Sheen	4.24
	11.24	10/11/2021	14.11	6.01	5.23	ND	NA	5.23
	11.24	10/27/2021	14.16	6.35	4.89	ND	NA	4.89
	11.24	11/10/2021	14.08	6.23	5.01	ND	NA	5.01
	11.24	12/6/2021	14.12	6.23	5.01	ND	NA	5.01
	11.24	12/16/2021	14.03	6.17	5.07	ND	NA	5.07
	11.24	1/10/2022	14.16	6.34	4.90	ND	NA	4.90
	11.24	2/2/2022	14.16	6.19	5.05	ND	NA	5.05
	11.24	3/3/2022	14.16	6.24	5.00	ND	NA	5.00
	11.24	3/7/2022	14.07	6.47	4.77	ND	NA	4.77
	11.24	4/14/2022	14.17	5.72	5.52	Sheen	NA	5.52
	11.24	5/11/2022	14.17	5.71	5.53	Sheen	NA	5.53
	11.24	5/23/2022	14.20	5.65	5.59	Sheen	NA	5.59
	11.24	6/22/2022	14.17	5.70	5.54	Sheen	NA	5.54

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-8	**Historical DTW range: 7.3 - 11**							
	Historical LNAPL Thickness range: ND							
	101.27	2/11/2011	22.35	7.48	93.79	ND	NA	93.79
	101.27	3/9/2011	22.35	7.56	93.71	ND	NA	93.71
	101.27	4/11/2011	22.35	7.60	93.67	ND	NA	93.67
	101.27	5/10/2011	NM	7.52	93.75	ND	NA	93.75
	101.27	6/15/2011	NM	7.58	93.69	ND	NA	93.69
	101.27	7/13/2011	NM	7.60	93.67	ND	NA	93.67
	101.27	8/9/2011	NM	7.90	93.37	ND	NA	93.37
	101.27	9/29/2011	NM	8.52	92.75	ND	NA	92.75
	101.27	12/14/2011	22.68	9.73	91.54	ND	NA	91.54
	101.27	12/15/2011	22.68	9.63	91.64	ND	NA	91.64
	101.27	1/26/2012	22.75	10.31	90.96	ND	NA	90.96
	101.27	1/27/2012	NM	7.15	94.12	ND	NA	94.12
	101.27	2/28/2012	22.71	10.86	90.41	ND	NA	90.41
	101.27	2/29/2012	NM	10.80	90.47	ND	NA	90.47
	101.27	3/26/2012	22.74	11.01	90.26	ND	NA	90.26
	101.27	3/27/2012	NM	11.10	90.17	ND	NA	90.17
	101.27	4/19/2012	23.76	11.24	90.03	ND	NA	90.03
	101.27	4/20/2012	NM	11.24	90.03	ND	NA	90.03
	101.27	5/24/2012	23.45	10.91	90.36	ND	NA	90.36
	101.27	5/25/2012	NM	10.90	90.37	ND	NA	90.37
	101.27	6/7/2012	22.81	9.79	91.48	ND	NA	91.48
	101.27	6/8/2012	NM	10.73	90.54	ND	NA	90.54
	101.27	7/18/2012	22.81	10.87	90.40	ND	NA	90.40
	101.27	7/19/2012	NM	10.93	90.34	ND	NA	90.34
	101.27	8/15/2012	22.77	11.04	90.23	ND	NA	90.23
	101.27	8/16/2012	NM	11.10	90.17	ND	NA	90.17
	101.27	9/13/2012	22.53	11.38	89.89	ND	NA	89.89
	101.27	9/14/2012	22.80	11.36	89.91	ND	NA	89.91
	101.27	10/25/2012	22.79	11.74	89.53	ND	NA	89.53
	101.27	10/26/2012	NM	11.65	89.62	ND	NA	89.62
	101.27	11/28/2012	22.76	10.95	90.32	ND	NA	90.32
	101.27	11/29/2012	NM	11.00	90.27	ND	NA	90.27
	101.27	12/19/2012	22.76	11.34	89.93	ND	NA	89.93
	101.27	12/20/2012	NM	11.42	89.85	ND	NA	89.85
	101.27	1/28/2013	22.80	11.31	89.96	ND	NA	89.96
	101.27	1/29/2013	NM	11.31	89.96	ND	NA	89.96
	101.27	2/25/2013	22.75	10.67	90.60	ND	NA	90.60
	101.27	2/26/2013	NM	10.68	90.59	ND	NA	90.59
	101.27	3/20/2013	22.80	10.46	90.81	ND	NA	90.81
	101.27	3/21/2013	NM	10.43	90.84	ND	NA	90.84
	101.27	4/29/2013	22.71	11.02	90.25	ND	NA	90.25
	101.27	4/30/2013	NM	11.06	90.21	ND	NA	90.21
	101.27	5/14/2013	22.78	11.04	90.23	ND	NA	90.23
	101.27	5/15/2013	NM	11.01	90.26	ND	NA	90.26
	101.27	6/17/2013	22.75	9.70	91.57	ND	NA	91.57
	101.27	6/18/2013	NM	9.71	91.56	ND	NA	91.56
	101.27	7/17/2013	22.80	10.34	90.93	ND	NA	90.93
	101.27	7/18/2013	NM	10.26	91.01	ND	NA	91.01
	101.27	8/27/2013	22.71	10.61	90.66	ND	NA	90.66
	101.27	8/28/2013	NM	10.63	90.64	ND	NA	90.64
	101.27	9/23/2013	22.75	11.14	90.13	ND	NA	90.13
	101.27	9/24/2013	NM	11.15	90.12	ND	NA	90.12
	101.27	10/24/2013	22.77	12.65	88.62	ND	NA	88.62
	101.27	10/25/2013	NM	12.62	88.65	ND	NA	88.65

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-8	101.27	1/7/2014	22.75	11.70	89.57	ND	NA	89.57
	101.27	1/8/2014	NM	11.77	89.50	ND	NA	89.50
	101.27	4/22/2014	22.76	10.48	90.79	ND	NA	90.79
	101.27	4/23/2014	NM	10.51	90.76	ND	NA	90.76
	101.27	7/24/2014	23.80	10.98	90.29	ND	NA	90.29
	101.27	7/25/2014	NM	10.40	90.87	ND	NA	90.87
	101.27	10/13/2014	22.75	11.63	89.64	ND	NA	89.64
	101.27	10/14/2014	NM	11.62	89.65	ND	NA	89.65
	101.27	1/22/2015	22.70	11.04	90.23	ND	NA	90.23
	101.27	1/26/2015	22.70	11.08	90.19	ND	NA	90.19
	101.27	4/28/2015	22.46	10.75	90.52	ND	NA	90.52
	101.27	4/29/2015	22.46	10.73	90.54	ND	NA	90.54
	101.27	7/29/2015	NM	9.72	91.55	ND	NA	91.55
	101.27	7/30/2015	NM	9.76	91.51	ND	NA	91.51
	101.27	10/14/2015	22.75	8.52	92.75	ND	NA	92.75
	101.27	10/15/2015	NM	8.83	92.44	ND	NA	92.44
	101.27	1/20/2016	22.73	10.65	90.62	ND	NA	90.62
	101.27	1/21/2016	NM	10.64	90.63	ND	NA	90.63
	101.27	4/19/2016	22.79	6.29	94.98	ND	NA	94.98
	101.27	4/20/2016	NM	6.29	94.98	ND	NA	94.98
	18.67	7/13/2016	22.73	7.38	11.29	ND	NA	11.29
	18.67	7/14/2016	NM	7.39	11.28	ND	NA	11.28
	18.67	10/25/2016	22.77	5.83	12.84	ND	NA	12.84
	18.67	10/26/2016	NM	5.84	12.83	ND	NA	12.83
	18.67	1/31/2017	NM	7.07	11.60	ND	NA	11.60
	18.67	2/1/2017	22.82	7.15	11.52	ND	NA	11.52
	18.67	4/25/2017	22.73	6.75	11.92	ND	NA	11.92
	18.67	4/26/2017	NM	6.53	12.14	ND	NA	12.14
	18.67	7/24/2017	22.73	7.28	11.39	ND	NA	11.39
	18.67	7/25/2017	NM	7.32	11.35	ND	NA	11.35
	18.67	10/9/2017	23.73	7.67	11.00	ND	NA	11.00
	18.67	10/10/2017	NM	7.62	11.05	ND	NA	11.05
	18.67	2/1/2018	22.71	7.31	11.36	ND	NA	11.36
	18.67	2/2/2018	22.74	7.41	11.26	ND	NA	11.26
	18.67	4/25/2018	22.86	7.13	11.54	ND	NA	11.54
	18.67	4/26/2018	22.86	7.14	11.53	ND	NA	11.53
	18.67	7/26/2018	22.78	7.64	11.03	ND	NA	11.03
	18.67	7/27/2018	22.78	7.67	11.00	ND	NA	11.00
	18.67	11/5/2018	22.83	8.00	10.67	ND	NA	10.67
	18.67	11/6/2018	22.75	7.92	10.75	ND	NA	10.75
	18.67	6/27/2019	22.72	7.92	10.75	ND	NA	10.75
	18.67	6/28/2019	22.72	7.95	10.72	ND	NA	10.72
	18.67	9/26/2019	22.76	8.25	10.42	ND	NA	10.42
	18.67	9/27/2019	22.76	8.26	10.41	ND	NA	10.41
	18.67	12/30/2019	22.83	7.50	11.17	ND	NA	11.17
	18.67	12/31/2019	22.81	7.51	11.16	ND	NA	11.16
	18.67	6/9/2020	22.42	8.34	10.33	ND	NA	10.33
	18.67	6/10/2020	22.42	8.45	10.22	ND	NA	10.22
	18.67	9/1/2020	22.48	7.90	10.77	ND	NA	10.77
	18.67	1/20/2021	22.56	9.32	9.35	ND	NA	9.35
	18.67	6/10/2021	22.67	14.52	4.15	ND	NA	4.15
	18.67	6/23/2021	22.73	5.29	13.38	ND	NA	13.38
	18.67	6/25/2021	NM	5.37	13.30	ND	NA	13.30
	18.67	7/30/2021	22.66	5.93	12.74	ND	NA	12.74
	18.67	8/6/2021	NM	6.01	12.66	ND	NA	12.66
	18.67	8/10/2021	NM	6.05	12.62	ND	NA	12.62

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-8	18.67	9/14/2021	22.72	6.28	12.39	ND	NA	12.39
	18.67	9/17/2021	NM	6.47	12.20	ND	NA	12.20
	18.67	10/11/2021	22.71	6.24	12.43	ND	NA	12.43
	18.67	10/27/2021	22.72	6.03	12.64	ND	NA	12.64
	18.67	11/10/2021	22.51	6.23	12.44	ND	NA	12.44
	18.67	12/16/2021	22.60	6.36	12.31	ND	NA	12.31
	18.67	1/10/2022	22.57	6.32	12.35	ND	NA	12.35
	18.67	2/2/2022	22.71	6.28	12.39	ND	NA	12.39
	18.67	3/3/2022	22.58	6.21	12.46	ND	NA	12.46
	18.67	3/7/2022	22.59	6.17	12.50	ND	NA	12.50
	18.67	4/14/2022	22.55	6.53	12.14	ND	N/A	12.14
	18.67	5/11/2022	22.55	6.77	11.90	ND	N/A	11.90
	18.67	5/25/2022	23.69	6.77	11.90	ND	N/A	11.90
	18.67	6/22/2022	22.55	6.65	12.02	ND	NA	12.02

Table 1
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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-9	**Historical DTW range: 11 - 14.6**							
	Historical LNAPL Thickness range: ND							
	100.67	2/11/2011	22.98	12.54	88.13	ND	NA	88.13
	100.67	3/9/2011	22.98	12.22	88.45	ND	NA	88.45
	100.67	4/11/2011	22.98	11.96	88.71	ND	NA	88.71
	100.67	5/10/2011	NM	12.09	88.58	ND	NA	88.58
	100.67	6/15/2011	NM	12.12	88.55	ND	NA	88.55
	100.67	7/13/2011	NM	12.12	88.55	ND	NA	88.55
	100.67	8/9/2011	NM	11.93	88.74	ND	NA	88.74
	100.67	9/29/2011	NM	11.57	89.10	ND	NA	89.10
	100.67	12/14/2011	23.50	11.36	89.31	ND	NA	89.31
	100.67	12/15/2011	23.50	11.06	89.61	ND	NA	89.61
	100.67	1/26/2012	23.65	12.16	88.51	ND	NA	88.51
	100.67	1/27/2012	NM	11.91	88.76	ND	NA	88.76
	100.67	2/28/2012	23.64	12.57	88.10	ND	NA	88.10
	100.67	2/29/2012	NM	12.36	88.31	ND	NA	88.31
	100.67	3/26/2012	23.65	12.81	87.86	ND	NA	87.86
	100.67	3/27/2012	NM	12.70	87.97	ND	NA	87.97
	100.67	4/19/2012	23.71	12.90	87.77	ND	NA	87.77
	100.67	4/20/2012	NM	12.86	87.81	ND	NA	87.81
	100.67	5/24/2012	23.69	12.95	87.72	ND	NA	87.72
	100.67	5/25/2012	NM	12.87	87.80	ND	NA	87.80
	100.67	6/7/2012	23.71	12.94	87.73	ND	NA	87.73
	100.67	6/8/2012	NM	12.77	87.90	ND	NA	87.90
	100.67	7/18/2012	23.66	12.89	87.78	ND	NA	87.78
	100.67	7/19/2012	NM	12.79	87.88	ND	NA	87.88
	100.67	8/15/2012	23.70	12.74	87.93	ND	NA	87.93
	100.67	8/16/2012	NM	12.64	88.03	ND	NA	88.03
	100.67	9/13/2012	23.46	12.84	87.83	ND	NA	87.83
	100.67	9/14/2012	23.80	11.36	89.31	ND	NA	89.31
	100.67	10/25/2012	23.71	13.05	87.62	ND	NA	87.62
	100.67	10/26/2012	NM	12.94	87.73	ND	NA	87.73
	100.67	11/28/2012	23.64	13.91	86.76	ND	NA	86.76
	100.67	11/29/2012	NM	13.01	87.66	ND	NA	87.66
	100.67	12/19/2012	23.87	13.10	87.57	ND	NA	87.57
	100.67	12/20/2012	NM	13.17	87.50	ND	NA	87.50
	100.67	1/28/2013	23.72	13.03	87.64	ND	NA	87.64
	100.67	1/29/2013	NM	12.97	87.70	ND	NA	87.70
	100.67	2/25/2013	23.62	12.85	87.82	ND	NA	87.82
	100.67	2/26/2013	NM	12.90	87.77	ND	NA	87.77
	100.67	3/20/2013	23.71	12.46	88.21	ND	NA	88.21
	100.67	3/21/2013	NM	12.42	88.25	ND	NA	88.25
	100.67	4/29/2013	23.65	12.41	88.26	ND	NA	88.26
	100.67	4/30/2013	NM	12.43	88.24	ND	NA	88.24
	100.67	5/14/2013	23.68	12.43	88.24	ND	NA	88.24
	100.67	5/15/2013	NM	12.44	88.23	ND	NA	88.23
	100.67	6/17/2013	23.66	12.12	88.55	ND	NA	88.55
	100.67	6/18/2013	NM	12.21	88.46	ND	NA	88.46
	100.67	7/17/2013	23.70	12.46	88.21	ND	NA	88.21
	100.67	7/18/2013	NM	12.34	88.33	ND	NA	88.33
	100.67	8/27/2013	23.65	12.57	88.10	ND	NA	88.10
	100.67	8/28/2013	NM	12.66	88.01	ND	NA	88.01
	100.67	9/23/2013	23.68	12.81	87.86	ND	NA	87.86
	100.67	9/24/2013	NM	12.83	87.84	ND	NA	87.84
	100.67	10/24/2013	23.69	13.00	87.67	ND	NA	87.67
	100.67	10/25/2013	NM	12.97	87.70	ND	NA	87.70

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-9	100.67	1/7/2014	23.70	13.26	87.41	ND	NA	87.41
	100.67	1/8/2014	NM	13.20	87.47	ND	NA	87.47
	100.67	4/22/2014	23.65	12.75	87.92	ND	NA	87.92
	100.67	4/23/2014	NM	12.80	87.87	ND	NA	87.87
	100.67	7/24/2014	23.70	13.48	87.19	ND	NA	87.19
	100.67	7/25/2014	NM	13.52	87.15	ND	NA	87.15
	100.67	10/13/2014	23.65	14.14	86.53	ND	NA	86.53
	100.67	10/14/2014	NM	14.15	86.52	ND	NA	86.52
	100.67	1/22/2015	23.65	13.69	86.98	ND	NA	86.98
	100.67	1/26/2015	23.65	13.71	86.96	ND	NA	86.96
	100.67	4/28/2015	26.64	13.07	87.60	ND	NA	87.60
	100.67	4/29/2015	26.64	13.01	87.66	ND	NA	87.66
	100.67	7/29/2015	NM	13.00	87.67	ND	NA	87.67
	100.67	7/30/2015	NM	12.97	87.70	ND	NA	87.70
	100.67	10/14/2015	23.66	12.98	87.69	ND	NA	87.69
	100.67	10/15/2015	NM	13.04	87.63	ND	NA	87.63
	100.67	1/20/2016	23.69	13.00	87.67	ND	NA	87.67
	100.67	1/21/2016	NM	13.02	87.65	ND	NA	87.65
	100.67	4/19/2016	23.68	12.5	88.17	ND	NA	88.17
	100.67	4/20/2016	NM	12.51	88.16	ND	NA	88.16
	18.06	7/13/2016	23.63	12.74	5.32	ND	NA	5.32
	18.06	7/14/2016	NM	12.69	5.37	ND	NA	5.37
	18.06	10/25/2016	25.78	12.98	5.08	ND	NA	5.08
	18.06	10/26/2016	NM	13	5.06	ND	NA	5.06
	18.06	1/31/2017	NM	13.08	4.98	ND	NA	4.98
	18.06	2/1/2017	23.70	13.15	4.91	ND	NA	4.91
	18.06	4/25/2017	23.64	12.47	5.59	ND	NA	5.59
	18.06	4/26/2017	NM	12.49	5.57	ND	NA	5.57
	18.06	7/24/2017	23.06	12.11	5.95	ND	NA	5.95
	18.06	7/25/2017	NM	12.15	5.91	ND	NA	5.91
	18.06	10/9/2014	24.97	12.79	5.27	ND	NA	5.27
	18.06	10/10/2017	NM	12.86	5.20	ND	NA	5.20
	18.06	2/1/2018	23.67	13.11	4.95	ND	NA	4.95
	18.06	2/2/2018	23.70	13.22	4.84	ND	NA	4.84
	18.06	4/25/2018	23.85	12.47	5.59	ND	NA	5.59
	18.06	4/26/2018	23.85	12.55	5.51	ND	NA	5.51
	18.06	7/26/2018	23.69	12.83	5.23	ND	NA	5.23
	18.06	7/27/2018	23.69	12.84	5.22	ND	NA	5.22
	18.06	11/5/2018	23.90	12.77	5.29	ND	NA	5.29
	18.06	11/6/2018	23.69	12.74	5.32	ND	NA	5.32
	18.06	6/27/2019	23.65	11.9	6.16	ND	NA	6.16
	18.06	6/28/2019	23.65	12.01	6.05	ND	NA	6.05
	18.06	9/26/2019	23.67	12.3	5.76	ND	NA	5.76
	18.06	9/27/2019	23.67	12.45	5.61	ND	NA	5.61
	18.06	12/30/2019	23.92	12.24	5.82	ND	NA	5.82
	18.06	12/31/2019	23.95	12.15	5.91	ND	NA	5.91
	18.06	6/9/2020	23.69	14.18	3.88	ND	NA	3.88
	18.06	6/10/2020	23.69	14.19	3.87	ND	NA	3.87
	18.06	9/1/2020	23.71	14.62	3.44	ND	NA	3.44
	18.06	1/20/2021	23.69	13.78	4.28	ND	NA	4.28
	18.06	6/10/2021	23.66	13.61	4.45	ND	NA	4.45
	18.06	6/23/2021	23.64	14.29	3.77	ND	NA	3.77
	18.06	6/25/2021	NM	14.20	3.86	ND	NA	3.86
	18.06	7/30/2021	23.68	13.78	4.28	ND	NA	4.28
	18.06	8/6/2021	NM	13.73	4.33	ND	NA	4.33
	18.06	8/10/2021	NM	13.72	4.34	ND	NA	4.34

Table 1
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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-9	18.06	9/14/2021	23.64	12.78	5.28	ND	NA	5.28
	18.06	9/17/2021	NM	13.36	4.70	ND	NA	4.70
	18.06	10/11/2021	23.67	13.12	4.94	ND	NA	4.94
	18.06	10/27/2021	23.66	13.12	4.94	ND	NA	4.94
	18.06	11/12/2021	23.65	13.12	4.94	ND	NA	4.94
	18.06	12/16/2021	23.68	13.20	4.86	ND	NA	4.86
	18.06	1/10/2022	23.65	13.26	4.80	ND	NA	4.80
	18.06	2/2/2022	23.62	12.73	5.33	ND	NA	5.33
	18.06	3/3/2022	23.65	13.11	4.95	ND	NA	4.95
	18.06	3/7/2022	23.63	13.01	5.05	ND	NA	5.05
	18.06	5/11/2022	23.65	12.48	5.58	ND	N/A	5.58
	18.67	5/25/2022	23.69	6.77	11.90	ND	N/A	11.90
	18.67	6/22/2022	23.65	6.65	12.02	ND	NA	12.02

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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-10	**Historical DTW range: 10.4 - 13.48**							
	Historical LNAPL Thickness range: ND - 0.75							
	99.9	2/11/2011	24.58	11.58	88.32	ND	NA	88.32
	99.9	3/9/2011	24.58	11.48	88.42	ND	NA	88.42
	99.9	4/11/2011	24.58	11.19	88.71	ND	NA	88.71
	99.9	5/10/2011	NM	NM	NM	ND	NA	NM
	99.9	6/15/2011	NM	11.21	88.69	ND	NA	88.69
	99.9	7/13/2011	NM	11.21	88.69	ND	NA	88.69
	99.9	8/9/2011	NM	10.83	89.07	ND	NA	89.07
	99.9	9/29/2011	NM	10.21	89.69	ND	NA	89.69
	99.9	12/14/2011	24.94	10.40	89.50	ND	NA	89.50
	99.9	12/15/2011	24.94	10.25	89.65	ND	NA	89.65
	99.9	1/26/2012	25.03	11.15	88.75	ND	NA	88.75
	99.9	1/27/2012	NM	11.04	88.86	ND	NA	88.86
	99.9	2/28/2012	24.96	11.78	88.12	ND	NA	88.12
	99.9	2/29/2012	NM	11.63	88.27	ND	NA	88.27
	99.9	3/26/2012	24.96	11.91	87.99	ND	NA	87.99
	99.9	3/27/2012	NM	11.97	87.93	ND	NA	87.93
	99.9	4/19/2012	25.02	12.03	87.87	ND	NA	87.87
	99.9	4/20/2012	NM	12.11	87.79	ND	NA	87.79
	99.9	5/24/2012	24.70	11.80	88.10	ND	NA	88.10
	99.9	5/25/2012	NM	11.66	88.24	ND	NA	88.24
	99.9	6/7/2012	25.04	11.66	88.24	ND	NA	88.24
	99.9	6/8/2012	NM	11.70	88.20	ND	NA	88.20
	99.9	7/18/2012	25.04	11.79	88.11	ND	NA	88.11
	99.9	7/19/2012	NM	11.76	88.14	ND	NA	88.14
	99.9	8/15/2012	25.02	11.76	88.14	ND	NA	88.14
	99.9	8/16/2012	NM	11.23	88.67	ND	NA	88.67
	99.9	9/13/2012	24.78	11.92	87.98	ND	NA	87.98
	99.9	9/14/2012	25.06	12.01	87.89	ND	NA	87.89
	99.9	10/25/2012	25.05	12.14	87.76	ND	NA	87.76
	99.9	10/26/2012	NM	12.06	87.84	ND	NA	87.84
	99.9	11/28/2012	24.94	12.05	87.85	ND	NA	87.85
	99.9	11/29/2012	NM	12.05	87.85	ND	NA	87.85
	99.9	12/19/2012	25.01	12.00	87.90	ND	NA	87.90
	99.9	12/20/2012	NM	11.94	87.96	ND	NA	87.96
	99.9	1/28/2013	25.06	11.78	88.12	ND	NA	88.12
	99.9	1/29/2013	NM	11.89	88.01	ND	NA	88.01
	99.9	2/25/2013	24.96	11.63	88.27	ND	NA	88.27
	99.9	2/26/2013	NM	11.59	88.31	ND	NA	88.31
	99.9	3/20/2013	24.95	11.03	88.87	ND	NA	88.87
	99.9	3/21/2013	NM	10.99	88.91	ND	NA	88.91
	99.9	4/29/2013	24.99	11.47	88.43	ND	NA	88.43
	99.9	4/30/2013	NM	11.50	88.40	ND	NA	88.40
	99.9	5/14/2013	25.02	11.19	88.71	ND	NA	88.71
	99.9	5/15/2013	NM	11.16	88.74	ND	NA	88.74
	99.9	6/17/2013	24.96	11.45	88.45	ND	NA	88.45
	99.9	6/18/2013	NM	11.50	88.40	ND	NA	88.40
	99.9	7/17/2013	25.01	11.28	88.62	ND	NA	88.62
	99.9	7/18/2013	NM	11.21	88.69	ND	NA	88.69
	99.9	8/27/2013	25.00	11.60	88.30	ND	NA	88.30
	99.9	8/28/2013	NM	11.64	88.26	ND	NA	88.26
	99.9	9/23/2013	24.99	11.91	87.99	ND	NA	87.99
	99.9	9/24/2013	NM	11.84	88.06	ND	NA	88.06
	99.9	10/24/2013	25.00	12.12	87.78	ND	NA	87.78
	99.9	10/25/2013	NM	12.13	87.77	ND	NA	87.77

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-10	99.9	1/7/2014	25.00	11.85	88.05	ND	NA	88.05
	99.9	1/8/2014	NM	11.93	87.97	ND	NA	87.97
	99.9	4/22/2014	25.00	11.31	88.59	ND	NA	88.59
	99.9	4/23/2014	NM	11.50	88.40	ND	NA	88.40
	99.9	7/24/2014	25.00	11.54	88.36	ND	NA	88.36
	99.9	7/25/2014	NM	11.66	88.24	ND	NA	88.24
	99.9	10/13/2014	25.00	13.04	86.86	ND	NA	86.86
	99.9	10/14/2014	NM	13.00	86.90	ND	NA	86.90
	99.9	1/22/2015	25.00	12.40	87.50	ND	NA	87.50
	99.9	1/26/2015	25.00	12.43	87.47	ND	NA	87.47
	99.9	4/28/2015	24.92	11.95	87.95	ND	NA	87.95
	99.9	4/29/2015	24.92	11.84	88.06	ND	NA	88.06
	99.9	7/29/2015	NM	12.00	87.90	ND	NA	87.90
	99.9	7/30/2015	NM	11.99	87.91	ND	NA	87.91
	99.9	10/14/2015	24.96	12.03	87.87	ND	NA	87.87
	99.9	10/15/2015	NM	12.16	87.74	ND	NA	87.74
	99.9	1/20/2016	25	12.10	87.80	ND	NA	87.80
	99.9	1/21/2016	NM	12.10	87.80	ND	NA	87.80
	99.9	4/19/2016	25	11.50	88.40	ND	NA	88.40
	99.9	4/20/2016	NM	11.50	88.40	ND	NA	88.40
	17.28	7/13/2016	24.98	11.89	5.39	ND	NA	5.39
	17.28	7/14/2016	NM	11.86	5.42	ND	NA	5.42
	17.28	10/25/2016	25	12.13	5.15	ND	NA	5.15
	17.28	10/26/2016	NM	12.16	5.12	ND	NA	5.12
	17.28	1/31/2017	25	11.77	5.51	ND	NA	5.51
	17.28	2/1/2017	NM	11.83	5.45	ND	NA	5.45
	17.28	4/25/2017	24.96	11.24	6.04	ND	NA	6.04
	17.28	4/26/2017	NM	11.27	6.01	ND	NA	6.01
	17.28	7/24/2017	24.97	11.17	6.11	ND	NA	6.11
	17.28	7/25/2017	NM	11.26	6.02	ND	NA	6.02
	17.28	10/9/2017	24.97	11.95	5.33	ND	NA	5.33
	17.28	10/10/2017	NM	12.05	5.23	ND	NA	5.23
	17.28	2/1/2018	24.96	12.06	5.22	ND	NA	5.22
	17.28	2/2/2018	24.96	12.24	5.04	ND	NA	5.04
	17.28	4/25/2018	25.1	10.90	6.38	ND	NA	6.38
	17.28	4/26/2018	25.1	11.10	6.18	ND	NA	6.18
	17.28	7/26/2018	25.4	11.84	5.44	ND	NA	5.44
	17.28	7/27/2018	25.4	11.91	5.37	ND	NA	5.37
	17.28	11/5/2018	25.28	11.91	5.37	ND	NA	5.37
	17.28	11/6/2018	25.05	11.80	5.48	ND	NA	5.48
	17.28	6/27/2019	24.94	10.93	6.35	ND	NA	6.35
	17.28	6/28/2019	24.94	10.97	6.31	ND	NA	6.31
	17.28	9/26/2019	24.98	11.59	5.69	ND	NA	5.69
	17.28	9/27/2019	24.98	11.77	5.51	ND	NA	5.51
	17.28	12/30/2019	25.21	11.50	5.78	10.75	0.75	6.34
	17.28	12/31/2019	25.2	11.45	5.83	10.78	0.67	6.33
	17.28	1/15/2020	25.21	11.92	5.36	11.21	0.71	5.89
	17.28	1/22/2020	25.1	11.70	5.58	ND	NA	5.58
	17.28	1/28/2020	25.08	11.61	5.67	11.61	0.00	5.67
	17.28	2/4/2020	25.04	11.72	5.56	11.71	0.01	5.57
	17.28	6/9/2020	24.97	12.72	4.56	ND	NA	4.56
	17.28	6/10/2020	24.97	12.79	4.49	ND	NA	4.49
	17.28	9/1/2020	25.05	13.48	3.80	13.47	0.01	3.81
	17.28	1/20/2021	25.02	11.69	5.59	11.68	0.01	5.60
	17.28	6/10/2021	24.98	11.46	5.82	ND	NA	5.82
	17.28	6/16/2021	24.99	11.60	5.68	ND	NA	5.68

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-10	17.28	6/23/2021	24.97	12.14	5.14	ND	NA	5.14
	17.28	6/25/2021	NM	12.13	5.15	ND	NA	5.15
	17.28	7/30/2021	25.00	12.14	5.14	ND	NA	5.14
	17.28	8/10/2021	NM	12.23	5.05	ND	NA	5.05
	17.28	9/14/2021	24.97	11.97	5.31	ND	NA	5.31
	17.28	9/17/2021	NM	11.25	6.03	ND	NA	6.03
	17.28	10/11/2021	25.00	11.42	5.86	ND	NA	5.86
	17.28	10/27/2021	24.93	10.89	6.39	ND	NA	6.39
	17.28	11/10/2021	24.98	10.89	6.39	ND	NA	6.39
	17.28	12/16/2021	24.99	11.35	5.93	ND	NA	5.93
	17.28	1/10/2022	24.97	11.30	5.98	ND	NA	5.98
	17.28	2/2/2022	24.40	11.01	6.27	ND	NA	6.27
	17.28	3/3/2022	24.95	11.26	6.02	ND	NA	6.02
	17.28	3/7/2022	24.94	11.15	6.13	ND	NA	6.13
	17.28	4/14/2022	24.96	10.64	6.64	ND	NA	6.64
	17.28	5/11/2022	24.96	10.64	6.64	ND	NA	6.64
	17.28	5/25/2022	25	10.63	6.65	ND	NA	6.65
	17.28	6/22/2022	24.96	10.51	6.77	ND	NA	6.77

Table 1
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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-12	**Historical DTW range: 12.5 - 14.75**							
	Historical LNAPL Thickness range: ND							
	100.7	2/11/2011	20.49	12.01	88.69	ND	NA	88.69
	100.7	3/9/2011	20.49	12.29	88.41	ND	NA	88.41
	100.7	4/11/2011	20.49	12.05	88.65	ND	NA	88.65
	100.7	5/10/2011	NM	NM	NM	ND	NA	NM
	100.7	6/15/2011	NM	12.08	88.62	ND	NA	88.62
	100.7	7/13/2011	NM	12.05	88.65	ND	NA	88.65
	100.7	8/9/2011	NM	12.14	88.56	ND	NA	88.56
	100.7	9/29/2011	NM	11.87	88.83	ND	NA	88.83
	100.7	12/14/2011	22.01	11.56	89.14	ND	NA	89.14
	100.7	12/15/2012	22.01	11.44	89.26	ND	NA	89.26
	100.7	1/26/2012	22.05	12.41	88.29	ND	NA	88.29
	100.7	1/27/2012	NM	12.21	88.49	ND	NA	88.49
	100.7	2/28/2012	22.03	12.75	87.95	ND	NA	87.95
	100.7	2/29/2012	NM	12.61	88.09	ND	NA	88.09
	100.7	3/26/2012	22.02	12.97	87.73	ND	NA	87.73
	100.7	3/27/2012	NM	12.95	87.75	ND	NA	87.75
	100.7	4/19/2012	22.07	13.17	87.53	ND	NA	87.53
	100.7	4/20/2012	NM	13.01	87.69	ND	NA	87.69
	100.7	5/24/2012	22.05	13.10	87.60	ND	NA	87.60
	100.7	5/25/2012	NM	13.01	87.69	ND	NA	87.69
	100.7	6/7/2012	22.11	12.99	87.71	ND	NA	87.71
	100.7	6/8/2012	NM	12.95	87.75	ND	NA	87.75
	100.7	7/18/2012	22.10	12.96	87.74	ND	NA	87.74
	100.7	7/19/2012	NM	12.92	87.78	ND	NA	87.78
	100.7	8/15/2012	22.08	12.87	87.83	ND	NA	87.83
	100.7	8/16/2012	NM	12.40	88.30	ND	NA	88.30
	100.7	9/13/2012	19.56	13.60	87.10	ND	NA	87.10
	100.7	9/14/2012	19.84	13.64	87.06	ND	NA	87.06
	100.7	10/25/2012	22.06	11.41	89.29	ND	NA	89.29
	100.7	10/26/2012	NM	13.11	87.59	ND	NA	87.59
	100.7	11/28/2012	22.02	12.64	88.06	ND	NA	88.06
	100.7	11/29/2012	NM	13.00	87.70	ND	NA	87.70
	100.7	12/19/2012	22.12	13.15	87.55	ND	NA	87.55
	100.7	12/20/2012	NM	13.23	87.47	ND	NA	87.47
	100.7	1/28/2013	22.10	12.97	87.73	ND	NA	87.73
	100.7	1/29/2013	NM	13.04	87.66	ND	NA	87.66
	100.7	2/25/2013	22.01	13.00	87.70	ND	NA	87.70
	100.7	2/26/2013	NM	12.88	87.82	ND	NA	87.82
	100.7	3/20/2013	22.10	12.72	87.98	ND	NA	87.98
	100.7	3/21/2013	NM	12.66	88.04	ND	NA	88.04
	100.7	4/29/2013	22.03	12.68	88.02	ND	NA	88.02
	100.7	4/30/2013	NM	12.69	88.01	ND	NA	88.01
	100.7	5/14/2013	22.05	12.66	88.04	ND	NA	88.04
	100.7	5/15/2013	NM	12.67	88.03	ND	NA	88.03
	100.7	6/17/2013	22.02	12.32	88.38	ND	NA	88.38
	100.7	6/18/2013	NM	12.36	88.34	ND	NA	88.34
	100.7	7/17/2013	22.09	12.62	88.08	ND	NA	88.08
	100.7	7/18/2013	NM	12.55	88.15	ND	NA	88.15
	100.7	8/27/2013	21.99	12.77	87.93	ND	NA	87.93
	100.7	8/28/2013	NM	12.79	87.91	ND	NA	87.91
	100.7	9/23/2013	22.00	12.95	87.75	ND	NA	87.75
	100.7	9/24/2013	NM	12.90	87.80	ND	NA	87.80
	100.7	10/24/2013	22.01	13.09	87.61	ND	NA	87.61
	100.7	10/25/2013	NM	13.09	87.61	ND	NA	87.61

Table 1
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Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-12	100.7	1/7/2014	22.02	12.87	87.83	ND	NA	87.83
	100.7	1/8/2014	NM	12.85	87.85	ND	NA	87.85
	100.7	4/22/2014	22.05	12.80	87.90	ND	NA	87.90
	100.7	4/23/2014	NM	12.90	87.80	ND	NA	87.80
	100.7	7/24/2014	22.06	14.44	86.26	ND	NA	86.26
	100.7	7/25/2014	NM	14.49	86.21	ND	NA	86.21
	100.7	10/13/2014	22.05	14.78	85.92	ND	NA	85.92
	100.7	10/14/2014	NM	14.83	85.87	ND	NA	85.87
	100.7	1/22/2015	21.94	13.68	87.02	ND	NA	87.02
	100.7	1/26/2015	21.94	13.71	86.99	ND	NA	86.99
	100.7	4/28/2015	22	13.32	87.38	ND	NA	87.38
	100.7	4/29/2015	22	13.14	87.56	ND	NA	87.56
	100.7	7/29/2015	NM	13.24	87.46	ND	NA	87.46
	100.7	7/30/2015	NM	13.20	87.50	ND	NA	87.50
	100.7	10/14/2015	22.07	13.19	87.51	ND	NA	87.51
	100.7	10/15/2015	NM	13.25	87.45	ND	NA	87.45
	100.7	1/20/2016	22.07	13.24	87.46	ND	NA	87.46
	100.7	1/21/2016	NM	13.21	87.49	ND	NA	87.49
	100.7	4/19/2016	NM	NM	NM	ND	NM	NM
	100.7	4/20/2016	NM	NM	NM	ND	NM	NM
	18.19	7/13/2016	22.05	12.99	5.20	ND	NA	5.20
	18.19	7/14/2016	NM	12.94	5.25	ND	NA	5.25
	18.19	10/25/2016	22.11	13.28	4.91	ND	NA	4.91
	18.19	10/26/2016	NM	13.34	4.85	ND	NA	4.85
	18.19	1/31/2017	22.11	13.53	4.66	ND	NA	4.66
	18.19	2/1/2017	NM	13.87	4.32	ND	NA	4.32
	18.19	4/25/2017	22.01	13.00	5.19	ND	NA	5.19
	18.19	4/26/2017	NM	12.83	5.36	ND	NA	5.36
	18.19	7/24/2017	22.01	12.42	5.77	ND	NA	5.77
	18.19	7/25/2017	NM	12.56	5.63	ND	NA	5.63
	18.19	10/9/2017	22.00	13.30	4.89	ND	NA	4.89
	18.19	10/10/2017	NM	13.38	4.81	ND	NA	4.81
	18.19	2/1/2018	22.03	12.99	5.20	ND	NA	5.20
	18.19	2/2/2018	22.07	13.11	5.08	ND	NA	5.08
	18.19	4/25/2018	22.14	12.8	5.39	ND	NA	5.39
	18.19	4/26/2018	22.14	12.89	5.30	ND	NA	5.30
	18.19	7/26/2018	22.07	13.04	5.15	ND	NA	5.15
	18.19	7/27/2018	22.07	13.09	5.10	ND	NA	5.10
	18.19	11/5/2018	22.20	13.04	5.15	ND	NA	5.15
	18.19	11/6/2018	22.10	12.99	5.20	ND	NA	5.20
	18.19	6/27/2019	21.89	12.09	6.10	ND	NA	6.10
	18.19	6/28/2019	21.89	12.22	5.97	ND	NA	5.97
	18.19	9/26/2019	21.84	12.53	5.66	ND	NA	5.66
	18.19	9/27/2019	21.84	12.63	5.56	ND	NA	5.56
	18.19	12/30/2019	22.02	12.39	5.80	ND	NA	5.80
	18.19	12/31/2019	22.04	12.47	5.72	ND	NA	5.72
	18.19	6/9/2020	22.02	14.32	3.87	ND	NA	3.87
	18.19	6/10/2020	22.02	14.37	3.82	ND	NA	3.82
	18.19	9/1/2020	22.08	14.75	3.44	ND	NA	3.44
	18.19	1/20/2021	21.95	13.83	4.36	ND	NA	4.36
	18.19	6/10/2021	22.02	13.72	4.47	ND	NA	4.47
	18.19	6/23/2021	22.02	14.01	4.18	ND	NA	4.18
	18.19	6/25/2021	NM	13.99	4.20	ND	NA	4.20
	18.19	7/30/2021	NM	NM	NM	ND	NA	NM
	18.19	8/10/2021	NM	13.80	4.39	ND	NA	4.39
	18.19	9/14/2021	21.91	12.80	5.39	ND	NA	5.39

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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-12	18.19	9/17/2021	NM	13.06	5.13	ND	NA	5.13
	18.19	10/27/2021	21.92	12.73	5.46	ND	NA	5.46
	18.19	11/10/2021	21.97	12.81	5.38	ND	NA	5.38
	18.19	12/16/2021	22.00	12.94	5.25	ND	NA	5.25
	18.19	1/10/2022	22.00	13.18	5.01	ND	NA	5.01
	18.19	2/2/2022	21.31	12.85	5.34	ND	NA	5.34
	18.19	3/3/2022	22.01	13.01	5.18	ND	NA	5.18
	18.19	3/7/2022	22.01	12.82	5.37	ND	NA	5.37
	18.19	4/14/2022	21.90	12.58	5.61	ND	N/A	5.61
	18.19	5/11/2022	21.90	12.40	5.79	ND	N/A	5.79
	18.19	6/22/2022	21.90	12.56	5.63	ND	NA	5.63

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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-13	**Historical DTW range: 11.9 - 13.1**							
	Historical LNAPL Thickness range: ND							
	99.78	2/11/2011	20.13	11.79	87.99	ND	NA	87.99
	99.78	3/9/2011	20.13	11.79	87.99	ND	NA	87.99
	99.78	4/11/2011	20.13	11.39	88.39	ND	NA	88.39
	99.78	5/10/2011	NM	NM	NM	NM	NA	NM
	99.78	6/15/2011	NM	11.41	88.37	ND	NA	88.37
	99.78	7/13/2011	NM	11.39	88.39	ND	NA	88.39
	99.78	8/9/2011	NM	11.40	88.38	ND	NA	88.38
	99.78	9/29/2011	NM	10.92	88.86	ND	NA	88.86
	99.78	12/14/2011	20.14	11.10	88.68	ND	NA	88.68
	99.78	12/15/2011	20.14	10.59	89.19	ND	NA	89.19
	99.78	1/26/2012	20.17	11.77	88.01	ND	NA	88.01
	99.78	1/27/2012	NM	11.43	88.35	ND	NA	88.35
	99.78	2/28/2012	20.16	12.08	87.70	ND	NA	87.70
	99.78	2/29/2012	NM	11.94	87.84	ND	NA	87.84
	99.78	3/26/2012	20.04	12.12	87.66	ND	NA	87.66
	99.78	3/27/2012	NM	12.20	87.58	ND	NA	87.58
	99.78	4/19/2012	20.24	12.28	87.50	ND	NA	87.50
	99.78	4/20/2012	NM	12.28	87.50	ND	NA	87.50
	99.78	5/24/2012	20.21	12.30	87.48	ND	NA	87.48
	99.78	5/25/2012	NM	12.25	87.53	ND	NA	87.53
	99.78	6/7/2012	20.21	12.15	87.63	ND	NA	87.63
	99.78	6/8/2012	NM	12.11	87.67	ND	NA	87.67
	99.78	7/18/2012	20.21	12.22	87.56	ND	NA	87.56
	99.78	7/19/2012	NM	12.27	87.51	ND	NA	87.51
	99.78	8/15/2012	20.17	12.19	87.59	ND	NA	87.59
	99.78	8/16/2012	NM	12.43	87.35	ND	NA	87.35
	99.78	9/13/2012	21.91	12.97	86.81	ND	NA	86.81
	99.78	9/14/2012	22.10	13.07	86.71	ND	NA	86.71
	99.78	10/25/2012	20.25	12.44	87.34	ND	NA	87.34
	99.78	10/26/2012	NM	12.41	87.37	ND	NA	87.37
	99.78	11/28/2012	20.19	13.05	86.73	ND	NA	86.73
	99.78	11/29/2012	NM	12.39	87.39	ND	NA	87.39
	99.78	12/19/2012	20.18	12.46	87.32	ND	NA	87.32
	99.78	12/20/2012	NM	12.49	87.29	ND	NA	87.29
	99.78	1/28/2013	20.25	12.55	87.23	ND	NA	87.23
	99.78	1/29/2013	NM	12.48	87.30	ND	NA	87.30
	99.78	2/25/2013	20.18	12.31	87.47	ND	NA	87.47
	99.78	2/26/2013	NM	12.30	87.48	ND	NA	87.48
	99.78	3/20/2013	20.25	12.10	87.68	ND	NA	87.68
	99.78	3/21/2013	NM	12.03	87.75	ND	NA	87.75
	99.78	4/29/2013	20.19	12.07	87.71	ND	NA	87.71
	99.78	4/30/2013	NM	12.11	87.67	ND	NA	87.67
	99.78	5/14/2013	20.21	12.12	87.66	ND	NA	87.66
	99.78	5/15/2013	NM	12.17	87.61	ND	NA	87.61
	99.78	6/17/2013	20.22	11.65	88.13	ND	NA	88.13
	99.78	6/18/2013	NM	11.65	88.13	ND	NA	88.13
	99.78	7/17/2013	20.21	11.96	87.82	ND	NA	87.82
	99.78	7/18/2013	NM	11.91	87.87	ND	NA	87.87
	99.78	8/27/2013	20.19	12.09	87.69	ND	NA	87.69
	99.78	8/28/2013	NM	12.11	87.67	ND	NA	87.67
	99.78	9/23/2013	20.20	12.34	87.44	ND	NA	87.44
	99.78	9/24/2013	NM	12.30	87.48	ND	NA	87.48
	99.78	10/24/2013	20.22	12.55	87.23	ND	NA	87.23
	99.78	10/25/2013	NM	12.60	87.18	ND	NA	87.18
	99.78	1/7/2014	20.20	12.03	87.75	ND	NA	87.75
	99.78	1/8/2014	NM	12.08	87.70	ND	NA	87.70

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MW-13	99.78	4/22/2014	20.17	12.03	87.75	ND	NA	87.75
	99.78	4/23/2014	NM	12.14	87.64	ND	NA	87.64
	99.78	7/24/2014	20.25	12.65	87.13	ND	NA	87.13
	99.78	7/25/2014	NM	12.72	87.06	ND	NA	87.06
	99.78	10/13/2014	20.18	13.32	86.46	ND	NA	86.46
	99.78	10/14/2014	NM	13.27	86.51	ND	NA	86.51
	99.78	1/22/2015	20.10	13.05	86.73	ND	NA	86.73
	99.78	1/26/2015	20.10	13.06	86.72	ND	NA	86.72
	99.78	4/28/2015	20.91	12.41	87.37	ND	NA	87.37
	99.78	4/29/2015	20.91	12.35	87.43	ND	NA	87.43
	99.78	7/29/2015	NM	12.36	87.42	ND	NA	87.42
	99.78	7/30/2015	NM	12.31	87.47	12.30	0.01	87.48
	99.78	10/14/2015	20.23	12.36	87.42	ND	NA	87.42
	99.78	10/15/2015	NM	12.47	87.31	ND	NA	87.31
	99.78	1/20/2016	20.16	12.66	87.12	ND	NA	87.12
	99.78	1/21/2016	NM	12.67	87.11	ND	NA	87.11
	99.78	4/19/2016	20.19	12.32	87.46	ND	NA	87.46
	99.78	4/20/2016	NM	12.33	87.45	ND	NA	87.45
	17.18	7/13/2016	20.49	12.41	4.77	ND	NA	4.77
	17.18	7/14/2016	NM	12.36	4.82	ND	NA	4.82
	17.18	10/25/2016	20.21	12.73	4.45	ND	NA	4.45
	17.18	10/26/2016	NM	12.76	4.42	ND	NA	4.42
	17.18	1/31/2017	20.19	12.60	4.58	ND	NA	4.58
	17.18	2/1/2017	NM	12.72	4.46	ND	NA	4.46
	17.18	4/25/2017	20.17	12.25	4.93	ND	NA	4.93
	17.18	4/26/2017	NM	12.24	4.94	ND	NA	4.94
	17.18	7/24/2017	20.17	11.85	5.33	ND	NA	5.33
	17.18	7/25/2017	NM	11.87	5.31	ND	NA	5.31
	17.18	10/9/2017	20.17	12.31	4.87	ND	NA	4.87
	17.18	10/10/2017	NM	12.36	4.82	ND	NA	4.82
	17.18	2/1/2018	20.23	12.41	4.77	ND	NA	4.77
	17.18	2/2/2018	20.26	12.05	5.13	ND	NA	5.13
	17.18	4/25/2018	20.30	11.93	5.25	ND	NA	5.25
	17.18	4/26/2018	20.30	12.04	5.14	ND	NA	5.14
	17.18	7/26/2018	20.25	12.24	4.94	ND	NA	4.94
	17.18	7/27/2018	20.25	12.27	4.91	ND	NA	4.91
	17.18	11/5/2018	20.36	13.04	4.14	ND	NA	4.14
	17.18	11/6/2018	20.27	12.30	4.88	ND	NA	4.88
	17.18	6/27/2019	20.18	11.57	5.61	ND	NA	5.61
	17.18	6/28/2019	20.18	11.57	5.61	ND	NA	5.61
	17.18	9/26/2019	20.19	12.02	5.16	ND	NA	5.16
	17.18	9/27/2019	20.19	12.17	5.01	ND	NA	5.01
	17.18	12/30/2019	20.38	11.94	5.24	ND	NA	5.24
	17.18	12/31/2019	20.40	11.95	5.23	ND	NA	5.23
	17.18	6/9/2020	20.18	12.99	4.19	ND	NA	4.19
	17.18	6/10/2020	20.18	13.07	4.11	ND	NA	4.11
	17.18	9/1/2020	20.26	12.56	4.62	ND	NA	4.62
	17.18	1/20/2021	20.24	12.95	4.23	ND	NA	4.23
	17.18	6/10/2021	20.19	12.67	4.51	ND	NA	4.51
	17.18	6/23/2021	20.18	12.86	4.32	ND	NA	4.32
	17.18	6/25/2021	NM	12.78	4.40	ND	NA	4.40
	17.18	7/30/2021	NM	NM	NM	ND	NM	NM
	17.18	8/10/2021	NM	12.60	4.58	ND	NA	4.58
	17.18	9/14/2021	20.15	12.06	5.12	ND	NA	5.12
	17.18	9/17/2021	NM	12.16	5.02	ND	NA	5.02
	17.18	10/27/2021	20.19	12.21	4.97	ND	NA	4.97
	17.18	11/10/2021	20.21	12.15	5.03	ND	NA	5.03

Table 1
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Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-13	17.18	12/16/2021	20.21	12.38	4.80	ND	NA	4.80
	17.18	1/10/2022	20.17	12.51	4.67	ND	NA	4.67
	17.18	2/2/2022	20.16	12.28	4.90	ND	NA	4.90
	17.18	3/3/2022	20.17	12.46	4.72	ND	NA	4.72
	17.18	3/7/2022	20.16	12.19	4.99	ND	NA	4.99
	17.18	4/14/2022	20.18	12.00	5.18	ND	N/A	5.18
	17.18	5/11/2022	20.18	11.87	5.31	ND	N/A	5.31
	17.18	6/22/2022	20.18	12.09	5.09	ND	NA	5.09

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-15	**Historical DTW range: 11.4 - 14**							
	Historical LNAPL Thickness range: ND							
	99.85	2/11/2011	21.53	10.61	89.24	ND	NA	89.24
	99.85	3/9/2011	21.53	10.87	88.98	ND	NA	88.98
	99.85	4/11/2011	21.53	10.98	88.87	ND	NA	88.87
	99.85	5/10/2011	NM	NM	NM	ND	NA	NM
	99.85	6/15/2011	NM	10.90	88.95	ND	NA	88.95
	99.85	7/13/2011	NM	10.89	88.96	ND	NA	88.96
	99.85	8/9/2011	NM	11.00	88.85	ND	NA	88.85
	99.85	9/29/2011	NM	9.79	90.06	ND	NA	90.06
	99.85	12/14/2011	21.01	10.33	89.52	ND	NA	89.52
	99.85	12/15/2011	21.01	10.13	89.72	ND	NA	89.72
	99.85	1/26/2012	21.05	11.10	88.75	ND	NA	88.75
	99.85	1/27/2012	NM	9.01	90.84	ND	NA	90.84
	99.85	2/28/2012	21.01	11.67	88.18	ND	NA	88.18
	99.85	2/29/2012	NM	11.49	88.36	ND	NA	88.36
	99.85	3/26/2012	21.03	10.93	88.92	ND	NA	88.92
	99.85	3/27/2012	NM	11.88	87.97	ND	NA	87.97
	99.85	4/19/2012	20.00	11.95	87.90	ND	NA	87.90
	99.85	4/20/2012	NM	11.96	87.89	ND	NA	87.89
	99.85	5/24/2012	21.00	11.66	88.19	ND	NA	88.19
	99.85	5/25/2012	NM	11.49	88.36	ND	NA	88.36
	99.85	6/7/2012	20.06	11.66	88.19	ND	NA	88.19
	99.85	6/8/2012	NM	11.65	88.20	ND	NA	88.20
	99.85	7/18/2012	21.09	11.87	87.98	ND	NA	87.98
	99.85	7/19/2012	NM	11.15	88.70	ND	NA	88.70
	99.85	8/15/2012	21.05	11.75	88.10	ND	NA	88.10
	99.85	8/16/2012	NM	11.68	88.17	ND	NA	88.17
	99.85	9/13/2012	21.52	10.91	88.94	ND	NA	88.94
	99.85	9/14/2012	21.32	11.93	87.92	ND	NA	87.92
	99.85	10/25/2012	21.04	11.71	88.14	ND	NA	88.14
	99.85	10/26/2012	NM	11.81	88.04	ND	NA	88.04
	99.85	11/28/2012	21.12	11.24	88.61	ND	NA	88.61
	99.85	11/29/2012	NM	11.37	88.48	ND	NA	88.48
	99.85	12/19/2012	21.10	11.88	87.97	ND	NA	87.97
	99.85	12/20/2012	NM	11.37	88.48	ND	NA	88.48
	99.85	1/28/2013	21.09	11.91	87.94	ND	NA	87.94
	99.85	1/29/2013	NM	11.74	88.11	ND	NA	88.11
	99.85	2/25/2013	21.05	11.19	88.66	ND	NA	88.66
	99.85	2/26/2013	NM	11.22	88.63	ND	NA	88.63
	99.85	3/20/2013	21.05	10.33	89.52	ND	NA	89.52
	99.85	3/21/2013	NM	11.02	88.83	ND	NA	88.83
	99.85	4/29/2013	21.03	11.56	88.29	ND	NA	88.29
	99.85	4/30/2013	NM	11.58	88.27	ND	NA	88.27
	99.85	5/14/2013	21.02	11.07	88.78	ND	NA	88.78
	99.85	5/15/2013	NM	11.08	88.77	ND	NA	88.77
	99.85	6/17/2013	21.00	11.91	87.94	ND	NA	87.94
	99.85	6/18/2013	NM	11.46	88.39	ND	NA	88.39
	99.85	7/17/2013	21.05	11.47	88.38	ND	NA	88.38
	99.85	7/18/2013	NM	11.40	88.45	ND	NA	88.45
	99.85	8/27/2013	20.98	11.60	88.25	ND	NA	88.25
	99.85	8/28/2013	NM	11.64	88.21	ND	NA	88.21
	99.85	9/23/2013	21.01	11.61	88.24	ND	NA	88.24
	99.85	9/24/2013	NM	11.65	88.20	ND	NA	88.20
	99.85	10/24/2013	21.00	12.09	87.76	ND	NA	87.76
	99.85	10/25/2013	NM	12.02	87.83	ND	NA	87.83

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-15	99.85	1/7/2014	21.01	11.74	88.11	ND	NA	88.11
	99.85	1/8/2014	NM	11.71	88.14	ND	NA	88.14
	99.85	4/22/2014	21.00	11.45	88.40	ND	NA	88.40
	99.85	4/23/2014	NM	11.57	88.28	ND	NA	88.28
	99.85	7/24/2014	21.05	12.20	87.65	ND	NA	87.65
	99.85	7/25/2014	NM	12.28	87.57	ND	NA	87.57
	99.85	10/13/2014	21.00	12.91	86.94	ND	NA	86.94
	99.85	10/14/2014	NM	12.93	86.92	ND	NA	86.92
	99.85	1/22/2015	NM	NM	NM	ND	NM	NM
	99.85	1/26/2015	21.00	12.88	86.97	ND	NA	86.97
	99.85	4/28/2015	21.04	9.59	90.26	ND	NA	90.26
	99.85	4/29/2015	21.04	11.84	88.01	ND	NA	88.01
	99.85	7/29/2015	NM	11.90	87.95	ND	NA	87.95
	99.85	7/30/2015	NM	11.94	87.91	11.93	0.01	87.92
	99.85	10/14/2015	20.97	11.80	88.05	ND	NA	88.05
	99.85	10/15/2015	NM	11.92	87.93	ND	NA	87.93
	99.85	1/20/2016	NM	NM	NM	NM	NM	NM
	99.85	1/21/2016	NM	NM	NM	NM	NM	NM
	99.85	4/19/2016	21.05	10.40	89.45	ND	NA	89.45
	99.85	4/20/2016	NM	10.43	89.42	ND	NA	89.42
	17.23	7/13/2016	20.97	11.79	5.44	ND	NA	5.44
	17.23	7/14/2016	NM	11.75	5.48	ND	NA	5.48
	17.23	10/25/2016	21.02	11.97	5.26	ND	NA	5.26
	17.23	10/26/2016	NM	12.04	5.19	ND	NA	5.19
	17.23	1/31/2017	20.99	11.70	5.53	ND	NA	5.53
	17.23	2/1/2017	NM	11.82	5.41	ND	NA	5.41
	17.23	4/25/2017	20.85	11.76	5.47	ND	NA	5.47
	17.23	4/26/2017	NM	10.00	7.23	ND	NA	7.23
	17.23	7/24/2017	20.91	10.81	6.42	ND	NA	6.42
	17.23	7/25/2017	NM	10.83	6.40	ND	NA	6.40
	17.23	10/9/2017	20.90	11.69	5.54	ND	NA	5.54
	17.23	10/10/2017	NM	11.74	5.49	ND	NA	5.49
	17.23	2/1/2018	20.88	12.01	5.22	ND	NA	5.22
	17.23	2/2/2018	20.86	12.04	5.19	ND	NA	5.19
	17.23	4/25/2018	20.95	11.40	5.83	ND	NA	5.83
	17.23	4/26/2018	20.95	11.44	5.79	ND	NA	5.79
	17.23	7/26/2018	20.51	12.17	5.06	ND	NA	5.06
	17.23	7/27/2018	20.51	12.26	4.97	ND	NA	4.97
	17.23	11/5/2018	20.57	12.29	4.94	ND	NA	4.94
	17.23	11/6/2018	20.30	12.22	5.01	ND	NA	5.01
	17.23	6/27/2019	20.34	11.53	5.70	ND	NM	5.70
	17.23	6/28/2019	20.34	11.55	5.68	ND	NM	5.68
	17.23	9/26/2019	20.53	11.94	5.29	ND	NA	5.29
	17.23	9/27/2019	20.53	12.09	5.14	ND	NA	5.14
	17.23	12/30/2019	20.66	11.86	5.37	ND	NA	5.37
	17.23	12/31/2019	20.64	11.86	5.37	ND	NA	5.37
	17.23	6/9/2020	20.39	13.58	3.65	ND	NA	3.65
	17.23	6/10/2020	20.39	13.63	3.60	ND	NA	3.60
	17.23	9/1/2020	20.41	13.91	3.32	ND	NA	3.32
	17.23	1/20/2021	20.43	13.27	3.96	ND	NA	3.96
	17.23	6/10/2021	20.37	12.09	5.14	ND	NA	5.14
	17.23	6/23/2021	20.41	13.40	3.83	ND	NA	3.83
	17.23	6/25/2021	NM	13.40	3.83	ND	NA	3.83
	17.23	7/30/2021	NM	NM	NM	ND	NM	NM
	17.23	8/10/2021	NM	13.17	4.06	ND	NA	4.06
	17.23	9/14/2021	20.38	12.16	5.07	ND	NA	5.07

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-15	17.23	9/17/2021	NM	12.24	4.99	ND	NA	4.99
	17.23	10/27/2021	20.4	12.00	5.23	ND	NA	5.23
	17.23	11/10/2021	20.42	11.95	5.28	ND	NA	5.28
	17.23	12/16/2021	20.42	12.19	5.04	ND	NA	5.04
	17.23	1/10/2022	NM	NM	NM	NM	NM	NM
	17.23	2/2/2022	20.36	12.11	5.12	ND	NA	5.12
	17.23	3/3/2022	20.31	12.21	5.02	ND	NA	5.02
	17.23	3/7/2022	20.31	11.98	5.25	ND	NA	5.25
	17.23	4/14/2022	NM	NM	N/A	NM	N/A	NM
	17.23	5/11/2022	NM	NM	N/A	NM	N/A	NM
	17.23	6/22/2022	NM	NM	NM	NM	NM	NM

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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-16 (IW-09)	**Historical DTW range: 5.4 - 7.8**							
	Historical LNAPL Thickness range: ND - 0.53							
	94.10	4/19/2012	NM	6.12	87.98	ND	NA	87.98
	94.10	4/20/2012	NM	6.37	87.73	5.94	0.43	88.05
	94.10	5/24/2012	NM	9.20	84.90	9.06	0.14	85.01
	94.10	5/25/2012	NM	6.66	87.44	5.90	0.76	88.01
	94.10	6/7/2012	NM	8.76	85.34	ND	NA	85.34
	94.10	6/8/2012	NM	5.93	88.17	5.91	0.02	88.19
	94.10	7/18/2012	12.88	8.69	85.41	8.67	0.02	85.43
	94.10	7/19/2012	NM	5.98	88.12	ND	NA	88.12
	94.10	8/15/2012	NM	8.84	85.26	ND	NA	85.26
	94.10	8/16/2012	NM	7.78	86.32	ND	NA	86.32
	94.10	9/13/2012	12.66	8.89	85.21	ND	NA	85.21
	94.10	9/14/2012	12.68	7.58	86.52	ND	NA	86.52
	94.10	10/25/2012	NM	8.82	85.28	ND	NA	85.28
	94.10	10/26/2012	NM	6.04	88.06	ND	NA	88.06
	94.10	11/28/2012	NM	8.42	85.68	ND	NA	85.68
	94.10	11/29/2012	NM	6.14	87.96	ND	NA	87.96
	94.10	12/19/2012	8.56	6.12	87.98	ND	NA	87.98
	94.10	12/20/2012	NM	8.52	85.58	ND	NA	85.58
	94.10	1/28/2013	9.29	8.94	85.16	ND	NA	85.16
	94.10	1/29/2013	NM	9.00	85.10	ND	NA	85.10
	94.10	2/25/2013	8.81	6.10	88.00	ND	NA	88.00
	94.10	2/26/2013	NM	8.67	85.43	ND	NA	85.43
	94.10	3/20/2013	8.45	5.63	88.47	ND	NA	88.47
	94.10	3/21/2013	NM	5.58	88.52	ND	NA	88.52
	94.10	4/29/2013	8.49	5.56	88.54	ND	NA	88.54
	94.10	4/30/2013	NM	5.70	88.40	ND	NA	88.40
	94.10	5/14/2013	8.48	5.48	88.62	ND	NA	88.62
	94.10	5/15/2013	NM	5.50	88.60	ND	NA	88.60
	94.10	6/17/2013	8.47	5.40	88.70	5.35	0.05	88.70
	94.10	6/18/2013	NM	8.55	85.55	8.49	0.06	85.55
	94.10	7/17/2013	9.32	8.26	85.84	7.99	0.27	85.84
	94.10	7/18/2013	NM	5.49	88.61	ND	NA	88.61
	94.10	8/27/2013	8.86	5.72	88.38	5.71	0.01	88.39
	94.10	8/28/2013	NM	8.64	85.46	ND	NA	85.46
	94.10	9/23/2013	8.89	8.68	85.42	ND	NA	85.42
	94.10	9/24/2013	NM	8.55	85.55	ND	NA	85.55
	94.10	10/24/2013	9.30	8.94	85.16	ND	NA	85.16
	94.10	10/25/2013	NM	6.11	87.99	ND	NA	87.99
	94.10	1/7/2014	9.31	7.13	86.97	ND	NA	86.97
	94.10	1/8/2014	NM	8.52	85.58	ND	NA	85.58
	94.10	4/22/2014	8.71	5.90	88.20	ND	NA	88.20
	94.10	4/23/2014	NM	6.00	88.10	ND	NA	88.10
	94.10	7/24/2014	12.75	6.75	87.35	6.57	0.18	87.49
	94.10	7/25/2014	NM	6.95	87.15	6.6	0.35	87.41
	94.10	10/13/2014	9.32	7.28	86.82	ND	NA	86.82
	94.10	10/14/2013	NM	7.27	86.83	ND	NA	86.83
	94.10	1/22/2015	7.80?	7.00	87.10	ND	NA	87.10
	94.10	1/26/2015	9.30	6.98	87.12	ND	NA	87.12
	94.10	4/28/2015	8.90	6.15	87.95	ND	NA	87.95
	94.10	4/29/2015	8.90	6.15	87.95	6.13	0.02	87.97
	94.10	7/29/2015	NM	6.42	87.68	6.13	0.29	87.90
	94.10	7/30/2015	NM	6.40	87.70	6.10	0.30	87.93
	94.10	10/14/2015	9.50	6.33	87.77	6.21	0.12	87.86
	94.10	10/15/2015	NM	6.36	87.74	6.19	0.17	87.87
	94.10	1/20/2016	8.92	6.30	87.80	ND	NA	87.80
	94.10	1/21/2016	NM	6.33	87.77	6.12	0.21	87.93

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-16 (IW-09)	94.10	4/19/2016	8.92	5.52	88.58	ND	NA	88.58
	94.10	4/20/2016	NM	5.82	88.28	5.62	0.20	88.43
	11.21	7/13/2016	8.90	5.90	5.31	5.89	0.01	5.31
	11.21	7/14/2016	NM	5.85	5.36	5.82	0.03	5.38
	11.21	10/25/2016	8.93	6.40	4.81	6.01	0.39	5.10
	11.21	10/26/2016	NM	6.55	4.66	6.05	0.50	5.04
	11.21	1/31/2017	8.91	6.14	5.07	6.14	Sheen	5.07
	11.21	2/1/2017	NM	6.18	5.03	6.18	Sheen	5.03
	11.21	4/25/2017	12.31	5.79	5.42	5.46	0.33	5.42
	11.21	4/26/2017	NM	5.51	5.70	5.51	Sheen	5.70
	11.21	7/24/2017	12.50	5.11	6.10	5.11	Sheen	6.10
	11.21	7/25/2017	NM	5.14	6.07	5.14	Sheen	6.07
	11.21	10/9/2017	12.10	5.85	5.36	5.85	Sheen	5.36
	11.21	10/10/2017	NM	5.88	5.33	5.88	Sheen	5.33
	11.21	2/1/2018	12.51	6.55	4.66	6.20	0.35	4.92
	11.21	2/2/2018	NM	6.43	4.78	6.31	0.12	4.87
	11.21	4/25/2018	10.20	5.67	5.54	5.68	0.01	5.55
	11.21	4/26/2018	10.20	6.02	5.19	5.80	0.22	5.19
	11.21	7/26/2018	10.20	6.03	5.18	6.00	0.03	5.20
	11.21	7/27/2018	10.20	5.99	5.22	5.97	0.02	5.24
	11.21	11/5/2018	7.00	6.10	5.11	5.93	0.17	5.24
	11.21	11/6/2018	7.18	6.10	5.11	5.88	0.22	5.28
	11.21	6/27/2019	7.16	5.39	5.82	5.00	0.39	6.11
	11.21	6/28/2019	7.16	6.54	4.67	6.52	0.02	4.69
	11.21	9/26/2019	7.43	5.86	5.35	5.33	0.53	5.75
	11.21	9/27/2019	7.43	6.04	5.17	5.91	0.13	5.27
	11.21	12/30/2019	NM	5.44	5.77	5.43	0.01	5.78
	11.21	12/31/2019	7.31	5.46	5.75	5.44	0.02	5.77
	11.21	6/9/2020	13.18	7.39	3.82	7.36	0.03	3.84
	11.21	6/10/2020	13.18	7.37	3.84	7.34	0.03	3.86
	11.21	9/1/2020	7.59	7.59	3.62	ND	NA	3.62
	11.21	1/20/2021	13.06	7.08	4.13	ND	NA	4.13
	11.21	6/10/2021	9.62	6.23	4.98	ND	NA	4.98
	11.21	6/23/2021	9.58	6.61	4.60	ND	NA	4.60
	11.21	6/25/2021	NM	5.53	5.68	ND	NA	5.68
	11.21	7/30/2021	9.78	6.42	4.79	ND	NA	4.79
	11.21	8/10/2021	NM	6.44	4.77	ND	NA	4.77
	11.21	9/14/2021	9.68	5.34	5.87	ND	NA	5.87
	11.21	9/17/2021	NM	5.72	5.49	ND	NA	5.49
	11.21	10/11/2021	9.48	5.34	5.87	5.34	Sheen	5.87
	11.21	10/27/2021	9.82	5.37	5.84	ND	NA	5.84
	11.21	11/10/2021	9.97	3.94	7.27	ND	NA	7.27
	11.21	12/6/2021	10.02	4.84	6.37	ND	NA	6.37
	11.21	12/16/2021	9.91	4.71	6.50	ND	NA	6.50
	11.21	1/10/2022	NM	1.08	10.13	ND	NA	10.13
	11.21	2/2/2022	9.88	7.12	4.09	ND	NA	4.09
	11.21	3/3/2022	9.91	3.82	7.39	ND	NA	7.39
	11.21	3/7/2022	9.72	3.68	7.53	ND	NA	7.53
	11.21	4/14/2022	9.74	5.22	5.99	ND	N/A	5.99
	11.21	5/11/2022	9.74	4.00	7.21	ND	N/A	7.21
	11.21	5/24/2022	9.69	4.94	6.27	ND	N/A	6.27
	11.21	6/22/2022	9.74	5.11	6.10	ND	NA	6.10

Table 1
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Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-17	**Historical DTW range: 16 - 17.8**							
	Historical LNAPL Thickness range: ND							
	104.6	5/14/2013	17.72	15.82	88.78	ND	NA	88.78
	104.6	5/15/2013	NM	15.82	88.78	ND	NA	88.78
	104.6	6/17/2013	17.70	15.68	88.92	ND	NA	88.92
	104.6	6/18/2013	NM	15.67	88.93	ND	NA	88.93
	104.6	7/17/2013	17.78	15.73	88.87	ND	NA	88.87
	104.6	7/18/2013	NM	15.75	88.85	ND	NA	88.85
	104.6	8/27/2013	17.72	15.93	88.67	ND	NA	88.67
	104.6	8/28/2013	NM	15.95	88.65	ND	NA	88.65
	104.6	9/23/2013	17.71	16.15	88.45	ND	NA	88.45
	104.6	9/24/2013	NM	16.08	88.52	ND	NA	88.52
	104.6	10/24/2013	17.71	16.39	88.21	ND	NA	88.21
	104.6	10/25/2013	NM	16.33	88.27	ND	NA	88.27
	104.6	1/7/2014	17.70	16.10	88.5	ND	NA	88.5
	104.6	1/8/2014	NM	16.08	88.52	ND	NA	88.52
	104.6	4/22/2014	17.75	16.00	88.6	ND	NA	88.6
	104.6	4/23/2014	NM	16.03	88.57	ND	NA	88.57
	104.6	7/24/2014	17.70	16.59	88.01	ND	NA	88.01
	104.6	7/25/2014	NM	16.6	88	ND	NA	88
	104.6	10/13/2014	17.65	17.35	87.25	ND	NA	87.25
	104.6	10/14/2014	NM	17.35	87.25	ND	NA	87.25
	104.6	1/22/2015	17.68	17.24	87.36	ND	NA	87.36
	104.6	1/26/2015	17.68	17.21	87.39	ND	NA	87.39
	104.6	4/28/2015	17.7	16.22	88.38	ND	NA	88.38
	104.6	4/29/2015	17.7	16.18	88.42	ND	NA	88.42
	104.6	7/29/2015	NM	16.25	88.35	ND	NA	88.35
	104.6	7/30/2015	NM	16.25	88.35	ND	NA	88.35
	104.6	10/14/2015	17.72	16.26	88.34	ND	NA	88.34
	104.6	10/15/2015	NM	16.31	88.29	ND	NA	88.29
	104.6	1/20/2016	17.72	16.52	88.08	ND	NA	88.08
	104.6	1/21/2016	NM	16.52	88.08	ND	NA	88.08
	104.6	4/19/2016	17.72	16.08	88.52	ND	NA	88.52
	104.6	4/20/2016	NM	16.07	88.53	ND	NA	88.53
	22.07	7/13/2016	17.69	16.05	6.02	ND	NA	6.02
	22.07	7/14/2016	NM	16.02	6.05	ND	NA	6.05
	22.07	10/25/2016	17.72	16.3	5.77	ND	NA	5.77
	22.07	10/26/2016	NM	16.32	5.75	ND	NA	5.75
	22.07	1/31/2017	17.72	16.42	5.65	ND	NA	5.65
	22.07	2/1/2017	NM	16.43	5.64	ND	NA	5.64
	22.07	4/25/2017	17.80	15.8	6.27	ND	NA	6.27
	22.07	4/26/2017	NM	15.84	6.23	ND	NA	6.23
	22.07	7/24/2017	17.68	15.35	6.72	ND	NA	6.72
	22.07	7/25/2017	NM	15.38	6.69	ND	NA	6.69
	22.07	10/9/2017	17.78	16.02	6.05	ND	NA	6.05
	22.07	10/10/2017	NM	16.04	6.03	ND	NA	6.03
	22.07	2/1/2018	17.74	16.6	5.47	ND	NA	5.47
	22.07	2/2/2018	17.74	16.64	5.43	ND	NA	5.43
	22.07	4/25/2018	17.9	15.94	6.13	ND	NA	6.13
	22.07	4/26/2018	17.9	15.95	6.12	ND	NA	6.12
	22.07	7/26/2018	17.76	16.24	5.83	ND	NA	5.83
	22.07	7/27/2018	17.76	16.26	5.81	ND	NA	5.81
	22.07	11/5/2018	17.82	16.34	5.73	ND	NA	5.73
	22.07	11/6/2018	17.80	16.3	5.77	ND	NA	5.77
	22.07	6/27/2019	17.67	15.40	6.67	ND	NM	6.67
	22.07	6/28/2019	17.67	15.40	6.67	ND	NM	6.67

Table 1
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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-17	22.07	9/26/2019	17.69	15.87	6.2	ND	NA	6.20
	22.07	9/27/2019	17.69	15.70	6.37	ND	NA	6.37
	22.07	12/30/2019	17.92	15.86	6.21	ND	NA	6.21
	22.07	12/31/2019	17.94	15.86	6.21	ND	NA	6.21
	22.07	6/9/2020	17.69	17.33	4.74	ND	NA	4.74
	22.07	6/10/2020	17.69	17.37	4.70	ND	NA	4.70
	22.07	9/1/2020	17.83	17.75	4.32	ND	NA	4.32
	22.07	1/20/2021	17.72	17.12	4.95	ND	NA	4.95
	22.07	6/10/2021	17.71	16.96	5.11	ND	NA	5.11
	22.07	6/23/2021	17.70	17.03	5.04	ND	NA	5.04
	22.07	6/25/2021	NM	17.07	5.00	ND	NA	5.00
	22.07	7/30/2021	17.72	17.10	4.97	ND	NA	4.97
	22.07	8/6/2021	NM	17.13	4.94	ND	NA	4.94
	22.07	8/10/2021	NM	17.11	4.96	ND	NA	4.96
	22.07	9/14/2021	17.68	16.03	6.04	ND	NA	6.04
	22.07	9/17/2021	NM	16.16	5.91	ND	NA	5.91
	22.07	10/27/2021	17.68	16.09	5.98	ND	NA	5.98
	22.07	11/10/2021	17.71	16.05	6.02	ND	NA	6.02
	22.07	12/16/2021	17.70	16.28	5.79	ND	NA	5.79
	22.07	1/10/2022	17.69	16.47	5.60	ND	NA	5.60
	22.07	2/2/2022	17.71	16.55	5.52	ND	NA	5.52
	22.07	3/3/2022	17.65	16.21	5.86	ND	NA	5.86
	22.07	3/7/2022	17.65	16.00	6.07	ND	NA	6.07
	22.07	4/14/2022	17.69	16.04	6.03	ND	N/A	6.03
	22.07	5/11/2022	17.69	15.83	6.24	ND	N/A	6.24
	22.07	5/25/2022	17.69	15.59	6.48	ND	N/A	6.48
	22.07	6/22/2022	17.69	15.93	6.14	ND	NA	6.14

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Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-18	**Historical DTW range: 12.6 - 15.1**							
	Historical LNAPL Thickness range: ND							
	100.56	5/14/2013	21.19	12.85	87.71	ND	NA	87.71
	100.56	5/15/2013	NM	12.85	87.71	ND	NA	87.71
	100.56	6/17/2013	21.19	12.59	87.97	ND	NA	87.97
	100.56	6/18/2013	NM	12.62	87.94	ND	NA	87.94
	100.56	7/17/2013	21.20	12.90	87.66	ND	NA	87.66
	100.56	7/18/2013	NM	12.87	87.69	ND	NA	87.69
	100.56	8/27/2013	21.19	13.16	87.40	ND	NA	87.40
	100.56	8/28/2013	NM	13.20	87.36	ND	NA	87.36
	100.56	9/23/2013	21.21	13.32	87.24	ND	NA	87.24
	100.56	9/24/2013	NM	13.26	87.30	ND	NA	87.30
	100.56	10/24/2013	21.20	13.76	86.80	ND	NA	86.80
	100.56	10/25/2013	NM	13.75	86.81	ND	NA	86.81
	100.56	1/7/2014	21.20	13.74	86.82	ND	NA	86.82
	100.56	1/8/2014	NM	13.77	86.79	ND	NA	86.79
	100.56	4/22/2014	21.13	13.11	87.45	ND	NA	87.45
	100.56	4/23/2014	NM	13.65	86.91	ND	NA	86.91
	100.56	7/24/2014	21.20	14.70	85.86	ND	NA	85.86
	100.56	7/25/2014	NM	13.96	86.60	ND	NA	86.60
	100.56	10/13/2014	21.15	14.70	85.86	ND	NA	85.86
	100.56	10/14/2014	NM	14.69	85.87	ND	NA	85.87
	100.56	1/22/2015	21.10	14.11	86.45	ND	NA	86.45
	100.56	1/26/2015	21.10	14.10	86.46	ND	NA	86.46
	100.56	4/28/2015	21.02	12.92	87.64	ND	NA	87.64
	100.56	4/29/2015	21.02	10.04	90.52	ND	NA	90.52
	100.56	7/29/2015	NM	13.68	86.88	ND	NA	86.88
	100.56	7/30/2015	NM	13.63	86.93	ND	NA	86.93
	100.56	10/14/2015	21.13	13.60	86.96	ND	NA	86.96
	100.56	10/15/2015	NM	13.68	86.88	ND	NA	86.88
	100.56	1/20/2016	21.14	13.73	86.83	ND	NA	86.83
	100.56	1/21/2016	NM	13.70	86.86	ND	NA	86.86
	100.56	4/19/2016	19.48	13.51	87.05	ND	NA	87.05
	100.56	4/20/2016	NM	13.55	87.01	ND	NA	87.01
	19.19	7/13/2016	21.14	13.44	5.75	ND	NA	5.75
	19.19	7/14/2016	NM	13.40	5.79	ND	NA	5.79
	19.19	10/25/2016	21.19	13.69	5.50	ND	NA	5.50
	19.19	10/26/2016	NM	13.70	5.49	ND	NA	5.49
	19.19	1/31/2017	21.17	13.57	5.62	ND	NA	5.62
	19.19	2/1/2017	NM	13.66	5.53	ND	NA	5.53
	19.19	4/25/2017	21.10	13.08	6.11	ND	NA	6.11
	19.19	4/26/2017	NM	13.04	6.15	ND	NA	6.15
	19.19	7/24/2017	21.10	12.62	6.57	ND	NA	6.57
	19.19	7/25/2017	NM	12.66	6.53	ND	NA	6.53
	19.19	10/9/2017	21.10	13.39	5.80	ND	NA	5.80
	19.19	10/10/2017	NM	13.48	5.71	ND	NA	5.71
	19.19	2/1/2018	21.14	13.80	5.39	ND	NA	5.39
	19.19	2/2/2018	21.14	13.93	5.26	ND	NA	5.26
	19.19	4/25/2018	21.17	12.96	6.23	ND	NA	6.23
	19.19	4/25/2018	21.17	13.08	6.11	ND	NA	6.11
	19.19	7/26/2018	21.15	13.15	6.04	ND	NA	6.04
	19.19	7/27/2018	21.15	13.24	5.95	ND	NA	5.95
	19.19	11/5/2018	21.27	13.23	5.96	ND	NA	5.96
	19.19	11/6/2018	21.20	13.25	5.94	ND	NA	5.94
	19.19	6/27/2019	21.11	12.58	6.61	ND	NM	6.61
	19.19	6/28/2019	21.11	12.56	6.63	ND	NM	6.63

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-18	19.19	9/26/2019	21.13	12.86	6.33	ND	NA	6.33
	19.19	9/27/2019	21.13	13.06	6.13	ND	NA	6.13
	19.19	12/30/2019	21.42	12.82	6.37	ND	NA	6.37
	19.19	12/31/2019	21.41	12.89	6.30	ND	NA	6.30
	19.19	6/9/2020	21.14	14.69	4.50	ND	NA	4.50
	19.19	6/10/2020	21.14	14.79	4.40	ND	NA	4.40
	19.19	9/1/2020	21.23	15.04	4.15	ND	NA	4.15
	19.19	1/20/2021	21.16	14.37	4.82	ND	NA	4.82
	19.19	6/10/2021	21.11	14.15	5.04	ND	NA	5.04
	19.19	6/16/2021	21.13	14.24	4.95	ND	NA	4.95
	19.19	6/23/2021	21.13	14.43	4.76	ND	NA	4.76
	19.19	6/25/2021	NM	14.43	4.76	ND	NA	4.76
	19.19	7/30/2021	21.00	14.16	5.03	ND	NA	5.03
	19.19	8/6/2021	NM	14.26	4.93	ND	NA	4.93
	19.19	8/10/2021	NM	14.26	4.93	ND	NA	4.93
	19.19	9/14/2021	21.11	13.02	6.17	ND	NA	6.17
	19.19	9/17/2021	NM	13.12	6.07	ND	NA	6.07
	19.19	10/11/2021	21.11	13.16	6.03	ND	NA	6.03
	19.19	10/27/2021	21.15	13.12	6.07	ND	NA	6.07
	19.19	11/10/2021	21.12	13.08	6.11	ND	NA	6.11
	19.19	12/16/2021	21.11	12.35	6.84	ND	NA	6.84
	19.19	1/10/2022	21.10	13.66	5.53	ND	NA	5.53
	19.19	2/2/2022	21.10	13.68	5.51	ND	NA	5.51
	19.19	3/3/2022	21.11	13.52	5.67	ND	NA	5.67
	19.19	3/7/2022	21.10	13.48	5.71	ND	NA	5.71
	19.19	4/14/2022	21.11	18.07	1.12	ND	N/A	1.12
	19.19	5/11/2022	21.11	5.73	13.46	ND	N/A	13.46
	19.19	5/25/2022	20.97	11.25	7.94	ND	N/A	7.94
	19.19	6/22/2022	21.11	15.29	3.90	ND	NA	3.90

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-19	**Historical DTW range: 12.4 - 15.0**							
	Historical LNAPL Thickness range: ND							
	101.65	5/14/2013	20.65	12.83	88.82	ND	NA	88.82
	101.65	5/15/2013	NM	12.83	88.82	ND	NA	88.82
	101.65	6/17/2013	20.64	12.43	89.22	ND	NA	89.22
	101.65	6/18/2013	NM	12.44	89.21	ND	NA	89.21
	101.65	7/17/2013	20.65	12.85	88.80	ND	NA	88.80
	101.65	7/18/2013	NM	12.86	88.79	ND	NA	88.79
	101.65	8/27/2013	20.62	13.15	88.50	ND	NA	88.50
	101.65	8/28/2013	NM	13.20	88.45	ND	NA	88.45
	101.65	9/23/2013	20.63	13.32	88.33	ND	NA	88.33
	101.65	9/24/2013	NM	13.27	88.38	ND	NA	88.38
	101.65	10/24/2013	20.63	13.69	87.96	ND	NA	87.96
	101.65	10/25/2013	NM	13.70	87.95	ND	NA	87.95
	101.65	1/7/2014	20.64	13.70	87.95	ND	NA	87.95
	101.65	1/8/2014	NM	13.73	87.92	ND	NA	87.92
	101.65	4/22/2014	20.60	13.02	88.63	ND	NA	88.63
	101.65	4/23/2014	NM	13.13	88.52	ND	NA	88.52
	101.65	7/24/2014	20.67	13.68	87.97	ND	NA	87.97
	101.65	7/25/2014	NM	13.72	87.93	ND	NA	87.93
	101.65	10/13/2014	20.63	14.57	87.08	ND	NA	87.08
	101.65	10/14/2014	NM	14.57	87.08	ND	NA	87.08
	101.65	1/22/2015	20.60	14.15	87.50	ND	NA	87.50
	101.65	1/26/2015	20.60	14.18	87.47	ND	NA	87.47
	101.65	4/28/2015	20.50	13.44	88.21	ND	NA	88.21
	101.65	4/29/2015	20.50	13.38	88.27	ND	NA	88.27
	101.65	7/29/2015	NM	13.53	88.12	13.54	0.01	88.13
	101.65	7/30/2015	NM	13.49	88.16	13.50	0.01	88.17
	101.65	10/14/2015	20.62	13.44	88.21	ND	NA	88.21
	101.65	10/15/2015	NM	13.52	88.13	ND	NA	88.13
	101.65	1/20/2016	20.65	13.60	88.05	ND	NA	88.05
	101.65	1/21/2016	NM	13.62	88.03	ND	NA	88.03
	101.65	4/19/2016	19.87	13.40	88.25	ND	NA	88.25
	101.65	4/20/2016	NM	13.40	88.25	ND	NA	88.25
	19.36	7/13/2016	20.57	13.34	6.02	ND	NA	6.02
	19.36	7/14/2016	NM	13.29	6.07	ND	NA	6.07
	19.36	10/25/2016	20.64	13.53	5.83	ND	NA	5.83
	19.36	10/26/2016	NM	13.57	5.79	ND	NA	5.79
	19.36	1/31/2017	20.64	13.86	5.50	ND	NA	5.50
	19.36	2/1/2017	NM	14.41	4.95	ND	NA	4.95
	19.36	4/25/2017	20.60	12.95	6.41	ND	NA	6.41
	19.36	4/26/2017	NM	12.93	6.43	ND	NA	6.43
	19.36	7/24/2017	20.60	12.47	6.89	ND	NA	6.89
	19.36	7/25/2017	NM	12.53	6.83	ND	NA	6.83
	19.36	10/9/2017	20.65	13.29	6.07	ND	NA	6.07
	19.36	10/10/2017	NM	13.36	6.00	ND	NA	6.00
	19.36	2/1/2018	20.03	13.81	5.55	ND	NA	5.55
	19.36	2/2/2018	20.04	13.90	5.46	ND	NA	5.46
	19.36	4/25/2018	20.80	12.88	6.48	ND	NA	6.48
	19.36	4/26/2018	20.80	12.99	6.37	ND	NA	6.37
	19.36	7/26/2018	20.81	13.14	6.22	ND	NA	6.22
	19.36	7/27/2018	20.81	13.20	6.16	ND	NA	6.16
	19.36	11/5/2018	20.74	13.37	5.99	ND	NA	5.99
	19.36	11/6/2018	20.65	13.33	6.03	ND	NA	6.03
	19.36	6/27/2019	20.61	12.42	6.94	ND	NM	6.94
	19.36	6/28/2019	20.61	12.44	6.92	ND	NM	6.92

Table 1
34 Berry Street
Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-19	19.36	9/26/2019	20.64	12.98	6.38	ND	NA	6.38
	19.36	9/27/2019	20.64	13.04	6.32	ND	NA	6.32
	19.36	12/30/2019	20.65	13.00	6.36	ND	NA	6.36
	19.36	12/31/2019	20.63	12.99	6.37	ND	NA	6.37
	19.36	6/9/2020	20.61	14.65	4.71	ND	NA	4.71
	19.36	6/10/2020	20.61	14.70	4.66	ND	NA	4.66
	19.36	9/1/2020	20.66	14.93	4.43	ND	NA	4.43
	19.36	1/20/2021	20.65	14.45	4.91	ND	NA	4.91
	19.36	6/10/2021	20.6	14.12	5.24	ND	NA	5.24
	19.36	6/23/2021	20.63	14.37	4.99	ND	NA	4.99
	19.36	6/25/2021	NM	14.38	4.98	ND	NA	4.98
	19.36	7/30/2021	NM	NM	NM	NM	NM	NM
	19.36	8/10/2021	NM	14.23	5.13	ND	NA	5.13
	19.36	9/14/2021	20.61	12.94	6.42	ND	NA	6.42
	19.36	9/17/2021	NM	13.07	6.29	ND	NA	6.29
	19.36	10/27/2021	20.61	13.12	6.24	ND	NA	6.24
	19.36	11/10/2021	20.63	13.12	6.24	ND	NA	6.24
	19.36	12/16/2021	20.60	13.45	5.91	ND	NA	5.91
	19.36	1/10/2022	20.62	13.23	6.13	ND	NA	6.13
	19.36	2/2/2022	20.11	13.19	6.17	ND	NA	6.17
	19.36	3/3/2022	20.12	13.31	6.05	ND	NA	6.05
	19.36	3/7/2022	20.11	13.13	6.23	ND	NA	6.23
	19.36	4/14/2022	20.55	13.13	6.23	ND	N/A	6.23
	19.36	5/11/2022	20.55	12.96	6.40	ND	N/A	6.40
	19.36	6/22/2022	20.55	13.09	6.27	ND	NA	6.27

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Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-20	**Historical DTW range: 12.3 - 14**							
	Historical LNAPL Thickness range: ND							
	19.7	7/13/2016	19.40	13.10	6.60	ND	NA	6.60
	19.7	7/14/2016	NM	13.11	6.59	ND	NA	6.59
	19.7	10/25/2016	19.25	13.23	6.47	ND	NA	6.47
	19.7	10/26/2016	NM	13.29	6.41	ND	NA	6.41
	19.7	1/31/2017	19.27	13.22	6.48	ND	NA	6.48
	19.7	2/1/2017	NM	13.21	6.49	ND	NA	6.49
	19.7	4/25/2017	19.26	12.82	6.88	ND	NA	6.88
	19.7	4/26/2017	NM	12.73	6.97	ND	NA	6.97
	19.7	7/24/2017	19.23	12.27	7.43	ND	NA	7.43
	19.7	7/25/2017	NM	12.35	7.35	ND	NA	7.35
	19.7	10/9/2017	19.24	13.08	6.62	ND	NA	6.62
	19.7	10/10/2017	NM	13.03	6.67	ND	NA	6.67
	19.7	2/1/2018	19.24	13.59	6.11	ND	NA	6.11
	19.7	2/2/2018	19.22	13.52	6.18	ND	NA	6.18
	19.7	4/25/2018	19.30	12.58	7.12	ND	NA	7.12
	19.7	4/26/2018	19.30	12.57	7.13	ND	NA	7.13
	19.7	7/26/2018	19.30	12.56	7.14	ND	NA	7.14
	19.7	7/27/2018	19.30	12.63	7.07	ND	NA	7.07
	19.7	11/5/2018	19.38	13.07	6.63	ND	NA	6.63
	19.7	11/6/2018	19.30	13.50	6.20	ND	NA	6.20
	19.70	6/27/2019	19.19	12.26	7.44	ND	NM	7.44
	19.70	6/28/2019	19.19	12.28	7.42	ND	NM	7.42
	19.70	9/26/2019	19.21	12.87	6.83	ND	NA	6.83
	19.70	9/27/2019	19.21	12.88	6.82	ND	NA	6.82
	19.70	12/30/2019	19.47	12.97	6.73	ND	NA	6.73
	19.70	12/31/2019	19.46	12.92	6.78	ND	NA	6.78
	19.70	6/9/2020	19.20	13.77	5.93	ND	NA	5.93
	19.70	6/10/2020	19.20	13.83	5.87	ND	NA	5.87
	19.70	9/1/2020	19.21	13.69	6.01	ND	NA	6.01
	19.70	1/20/2021	19.22	13.94	5.76	ND	NA	5.76
	19.70	6/10/2021	20.63	14.11	5.59	ND	NA	5.59
	19.70	6/16/2021	19.18	13.28	6.42	ND	NA	6.42
	19.70	6/23/2021	19.18	13.40	6.30	ND	NA	6.30
	19.70	6/25/2021	NM	13.41	6.29	ND	NA	6.29
	19.70	7/30/2021	19.2	13.06	6.64	ND	NA	6.64
	19.70	8/6/2021	NM	13.37	6.33	ND	NA	6.33
	19.70	8/10/2021	NM	13.43	6.27	ND	NA	6.27
	19.70	9/14/2021	19.2	12.12	7.58	ND	NA	7.58
	19.70	9/17/2021	NM	12.27	7.43	ND	NA	7.43
	19.70	10/27/2021	19.19	12.39	7.31	ND	NA	7.31
	19.70	11/10/2021	19.22	12.63	7.07	ND	NA	7.07
	19.70	12/16/2021	19.2	13.05	6.65	ND	NA	6.65
	19.70	1/10/2022	19.18	13.31	6.39	ND	NA	6.39
	19.70	2/2/2022	19.2	13.29	6.41	ND	NA	6.41
	19.70	3/3/2022	19.17	13.26	6.44	ND	NA	6.44
	19.70	3/7/2022	19.18	13.09	6.61	ND	NA	6.61
	19.70	4/14/2022	19.19	12.93	6.77	ND	N/A	6.77
	19.70	5/11/2022	19.19	12.46	7.24	ND	N/A	7.24
	19.70	5/25/2022	19.13	11.28	8.42	ND	N/A	8.42
	19.70	6/22/2022	NM	NM	NM	NM	NM	NM

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MW-21	**Historical DTW range: 14.8 - 16.4**							
	Historical LNAPL Thickness range: ND							
	20.62	7/13/2016	18.03	14.61	6.01	ND	NA	6.01
	20.62	7/14/2016	NM	14.56	6.06	ND	NA	6.06
	20.62	10/25/2016	18.05	14.88	5.74	ND	NA	5.74
	20.62	10/26/2016	NM	14.89	5.73	ND	NA	5.73
	20.62	1/31/2017	18.08	14.14	6.48	ND	NA	6.48
	20.62	2/1/2017	NM	14.86	5.76	ND	NA	5.76
	20.62	4/25/2017	18.02	14.27	6.35	ND	NA	6.35
	20.62	4/26/2017	NM	14.29	6.33	ND	NA	6.33
	20.62	7/24/2017	18.05	13.83	6.79	ND	NA	6.79
	20.62	7/25/2017	NM	13.87	6.75	ND	NA	6.75
	20.62	10/9/2017	18.01	14.58	6.04	ND	NA	6.04
	20.62	10/10/2017	NM	14.60	6.02	ND	NA	6.02
	20.62	2/1/2018	18.08	15.14	5.48	ND	NA	5.48
	20.62	2/2/2018	18.05	15.19	5.43	ND	NA	5.43
	20.62	4/25/2018	18.10	14.38	6.24	ND	NA	6.24
	20.62	4/26/2018	18.10	14.43	6.19	ND	NA	6.19
	20.62	7/26/2018	18.04	14.67	5.95	ND	NA	5.95
	20.62	7/27/2018	18.04	14.68	5.94	ND	NA	5.94
	20.62	11/5/2018	18.22	14.83	5.79	ND	NA	5.79
	20.62	11/6/2018	18.50	14.76	5.86	ND	NA	5.86
	20.62	6/27/2019	17.98	13.88	6.74	ND	NM	6.74
	20.62	6/28/2019	17.98	13.88	6.74	ND	NM	6.74
	20.62	9/26/2019	18.02	14.23	6.39	ND	NA	6.39
	20.62	9/27/2019	18.02	14.28	6.34	ND	NA	6.34
	20.62	12/30/2019	18.08	14.40	6.22	ND	NA	6.22
	20.62	12/31/2019	18.10	14.38	6.24	ND	NA	6.24
	20.62	6/9/2020	18.00	15.99	4.63	ND	NA	4.63
	20.62	6/10/2020	18.00	16.04	4.58	ND	NA	4.58
	20.62	9/1/2020	18.24	16.41	4.21	ND	NA	4.21
	20.62	1/20/2021	18.06	15.72	4.90	ND	NA	4.90
	20.62	6/10/2021	NM	NM	NM	ND	NA	NA
	20.62	6/23/2021	18.02	15.62	5.00	ND	NA	5.00
	20.62	6/25/2021	NM	15.66	4.96	ND	NA	4.96
	20.62	7/30/2021	18.24	16.56	4.06	ND	NA	4.06
	20.62	8/6/2021	NM	15.64	4.98	ND	NA	4.98
	20.62	8/10/2021	NM	15.63	4.99	ND	NA	4.99
	20.62	9/14/2021	18.07	14.38	6.24	ND	NA	6.24
	20.62	9/17/2021	NM	14.48	6.14	ND	NA	6.14
	20.62	10/27/2021	18.06	14.45	6.17	ND	NA	6.17
	20.62	11/10/2021	18.1	14.42	6.20	ND	NA	6.20
	20.62	12/16/2021	18.08	14.72	5.90	ND	NA	5.90
	20.62	1/10/2022	18.05	15.02	5.60	ND	NA	5.60
	20.62	2/2/2022	18.02	14.88	5.74	ND	NA	5.74
	20.62	3/3/2022	18.05	14.79	5.83	ND	NA	5.83
	20.62	3/7/2022	18.05	14.68	5.94	ND	NA	5.94
	20.62	4/14/2022	18.08	14.56	6.06	ND	N/A	6.06
	20.62	5/11/2022	18.08	14.32	6.30	ND	N/A	6.30
	20.62	6/22/2022	NM	NM	NM	NM	NM	NM

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MW-22	**Historical DTW range: 5 - 7.3**							
	Historical LNAPL Thickness range: ND							
	11.37	7/13/2016	9.07	5.90	5.47	ND	NA	5.47
	11.37	7/14/2016	NM	5.78	5.59	ND	NA	5.59
	11.37	10/25/2016	9.08	6.12	5.25	ND	NA	5.25
	11.37	10/26/2016	NM	6.18	5.19	ND	NA	5.19
	11.37	1/31/2017	9.10	6.15	5.22	ND	NA	5.22
	11.37	2/1/2017	NM	6.18	5.19	ND	NA	5.19
	11.37	4/25/2017	9.07	5.56	5.81	ND	NA	5.81
	11.37	4/26/2017	NM	5.51	5.86	ND	NA	5.86
	11.37	7/24/2017	9.08	5.05	6.32	ND	NA	6.32
	11.37	7/25/2017	NM	5.10	6.27	ND	NA	6.27
	11.37	10/9/2017	9.08	5.78	5.59	ND	NA	5.59
	11.37	10/10/2017	NM	5.86	5.51	ND	NA	5.51
	11.37	2/1/2018	9.05	6.16	5.21	ND	NA	5.21
	11.37	2/2/2018	9.08	6.24	5.13	ND	NA	5.13
	11.37	4/25/2018	9.10	5.60	5.77	ND	NA	5.77
	11.37	4/26/2018	9.10	5.74	5.63	ND	NA	5.63
	11.37	7/26/2018	9.10	5.96	5.41	ND	NA	5.41
	11.37	7/27/2018	9.10	5.91	5.46	ND	NA	5.46
	11.37	11/5/2018	9.13	5.04	6.33	ND	NA	6.33
	11.37	11/6/2018	9.13	4.95	6.42	ND	NA	6.42
	11.37	6/27/2019	9.08	5.03	6.34	ND	NM	6.34
	11.37	6/28/2019	9.08	5.09	6.28	ND	NM	6.28
	11.37	9/26/2019	9.08	5.32	6.05	ND	NA	6.05
	11.37	9/27/2019	9.08	5.40	5.97	ND	NA	5.97
	11.37	12/30/2019	9.31	5.43	5.94	ND	NA	5.94
	11.37	12/31/2019	9.32	5.45	5.92	ND	NA	5.92
	11.37	6/9/2020	8.98	7.28	4.09	ND	NA	4.09
	11.37	6/10/2020	8.98	7.24	4.13	ND	NA	4.13
	11.37	9/1/2020	9.11	7.27	4.10	ND	NA	4.10
	11.37	1/20/2021	9.03	6.84	4.53	ND	NA	4.53
	11.37	6/11/2021	9.04	7.71	3.66	ND	NA	3.66
	11.37	6/16/2021	9.1	6.92	4.45	ND	NA	4.45
	11.37	6/23/2021	9.01	7.18	4.19	ND	NA	4.19
	11.37	6/25/2021	NM	7.18	4.19	ND	NA	4.19
	11.37	7/30/2021	9.07	7.09	4.28	ND	NA	4.28
	11.37	8/6/2021	NM	6.82	4.55	ND	NA	4.55
	11.37	8/10/2021	NM	6.88	4.49	ND	NA	4.49
	11.37	9/14/2021	9.07	5.50	5.87	ND	NA	5.87
	11.37	9/17/2021	NM	5.57	5.80	ND	NA	5.80
	11.37	10/27/2021	9.02	5.63	5.74	ND	NA	5.74
	11.37	11/10/2021	9.01	5.63	5.74	ND	NA	5.74
	11.37	12/6/2021	9.07	5.71	5.66	ND	NA	5.66
	11.37	12/16/2021	9.07	5.83	5.54	ND	NA	5.54
	11.37	1/10/2022	9.00	6.02	5.35	ND	NA	5.35
	11.37	2/2/2022	9.08	5.84	5.53	ND	NA	5.53
	11.37	3/3/2022	9.03	5.77	5.60	ND	NA	5.60
	11.37	3/7/2022	8.99	5.51	5.86	ND	NA	5.86
	11.37	4/14/2022	9.08	5.56	5.81	ND	N/A	5.81
	11.37	5/11/2022	9.08	4.36	7.01	ND	N/A	7.01
	11.37	5/23/2022	9.08	4.39	6.98	ND	N/A	6.98
	11.37	6/22/2022	9.08	2.54	8.83	ND	NA	8.83

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MW-22D	**Historical DTW range: 5.2 - 8**							
	Historical LNAPL Thickness range: ND							
	11.39	11/5/2018	35.25	6.15	5.24	ND	NA	5.24
	11.39	11/6/2018	35.30	6.08	5.31	ND	NA	5.31
	11.39	6/27/2019	35.15	5.21	6.18	ND	NM	6.18
	11.39	6/28/2019	35.15	5.27	6.12	ND	NM	6.12
	11.39	9/26/2019	35.16	5.57	5.82	ND	NA	5.82
	11.39	9/27/2019	35.16	5.69	5.70	ND	NA	5.70
	11.39	12/30/2019	35.68	5.64	5.75	ND	NA	5.75
	11.39	12/31/2019	35.66	5.68	5.71	ND	NA	5.71
	11.39	6/9/2020	35.14	7.48	3.91	ND	NA	3.91
	11.39	6/10/2020	35.14	7.53	3.86	ND	NA	3.86
	11.39	9/1/2020	35.49	7.99	3.40	ND	NA	3.40
	11.39	1/20/2021	35.20	7.18	4.21	ND	NA	4.21
	11.39	6/11/2021	NM	NM	NM	NM	NM	NM
	11.39	6/23/2021	35.16	7.29	4.10	ND	NA	4.10
	11.39	6/25/2021	NM	7.25	4.14	ND	NA	4.14
	11.39	7/30/2021	NM	NM	NM	NM	NM	NM
	11.39	8/10/2021	NM	NM	NM	NM	NM	NM
	11.39	9/14/2021	35.17	6.18	5.21	ND	NA	5.21
	11.39	9/17/2021	NM	6.29	5.10	ND	NA	5.10
	11.39	10/27/2021	35.16	6.01	5.38	ND	NA	5.38
	11.39	11/10/2021	35.16	5.99	5.40	ND	NA	5.40
	11.39	12/16/2021	35.17	6.19	5.20	ND	NA	5.20
	11.39	1/10/2022	NM	6.35	5.04	ND	NA	5.04
	11.39	2/2/2022	35.2	6.34	5.05	ND	NA	5.05
	11.39	3/3/2022	35.22	6.03	5.36	ND	NA	5.36
	11.39	3/7/2022	35.22	5.91	5.48	ND	NA	5.48
	11.39	4/14/2022	35.16	5.86	5.53	ND	N/A	5.53
	11.39	5/11/2022	35.16	5.70	5.69	ND	N/A	5.69
	11.39	5/23/2022	35.17	5.67	5.72	ND	N/A	5.72
	11.39	6/22/2022	35.16	5.54	5.85	ND	NA	5.85

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MW-23	**Historical DTW range: 5.3 - 8.8**							
	Historical LNAPL Thickness range: ND							
	11.42	7/13/2016	10.01	6.09	5.33	ND	NA	5.33
	11.42	7/14/2016	NM	5.97	5.45	ND	NA	5.45
	11.42	10/25/2016	10.03	6.30	5.12	ND	NA	5.12
	11.42	10/26/2016	NM	6.35	5.07	ND	NA	5.07
	11.42	1/31/2017	10.04	6.33	5.09	ND	NA	5.09
	11.42	2/1/2017	NM	6.36	5.06	ND	NA	5.06
	11.42	4/25/2017	10.01	5.74	5.68	ND	NA	5.68
	11.42	4/26/2017	NM	5.72	5.70	ND	NA	5.70
	11.42	7/24/2017	10.01	5.27	6.15	ND	NA	6.15
	11.42	7/25/2017	NM	5.32	6.10	ND	NA	6.10
	11.42	10/9/2017	10.05	5.96	5.46	ND	NA	5.46
	11.42	10/10/2017	NM	6.03	5.39	ND	NA	5.39
	11.42	2/1/2018	10.02	6.30	5.12	ND	NA	5.12
	11.42	2/2/2018	9.98	6.41	5.01	ND	NA	5.01
	11.42	4/25/2018	10.03	5.79	5.63	ND	NA	5.63
	11.42	4/26/2018	10.03	5.86	5.56	ND	NA	5.56
	11.42	7/26/2018	10.03	6.07	5.35	ND	NA	5.35
	11.42	7/27/2018	10.03	6.12	5.30	ND	NA	5.30
	11.42	11/5/2018	10.05	6.07	5.35	ND	NA	5.35
	11.42	11/6/2018	10.01	5.97	5.45	ND	NA	5.45
	11.42	6/27/2019	10.02	5.20	6.22	ND	NM	6.22
	11.42	6/28/2019	10.02	5.27	6.15	ND	NM	6.15
	11.42	9/26/2019	10.02	5.52	5.90	ND	NA	5.90
	11.42	9/27/2019	10.02	5.69	5.73	ND	NA	5.73
	11.42	12/30/2019	10.08	5.56	5.86	ND	NA	5.86
	11.42	12/31/2019	10.07	5.58	5.84	ND	NA	5.84
	11.42	6/9/2020	10.01	7.43	3.99	ND	NA	3.99
	11.42	6/10/2020	10.01	7.43	3.99	ND	NA	3.99
	11.42	9/1/2020	10.04	8.84	2.58	ND	NA	2.58
	11.42	1/20/2021	10.04	7.09	4.33	ND	NA	4.33
	11.42	6/11/2021	10.01	7.01	4.41	ND	NA	4.41
	11.42	6/23/2021	10.01	7.19	4.23	ND	NA	4.23
	11.42	6/25/2021	NM	7.18	4.24	ND	NA	4.24
	11.42	7/30/2021	10.06	7.07	4.35	ND	NA	4.35
	11.42	8/6/2021	NM	7.07	4.35	ND	NA	4.35
	11.42	8/10/2021	NM	7.05	4.37	ND	NA	4.37
	11.42	9/14/2021	10.01	6.12	5.30	ND	NA	5.30
	11.42	9/17/2021	NM	6.23	5.19	ND	NA	5.19
	11.42	10/27/2021	10.01	6.00	5.42	ND	NA	5.42
	11.42	11/10/2021	10.01	5.91	5.51	ND	NA	5.51
	11.42	12/6/2021	10.00	6.00	5.42	ND	NA	5.42
	11.42	12/16/2021	10.01	6.05	5.37	ND	NA	5.37
	11.42	1/10/2022	10.00	6.25	5.17	ND	NA	5.17
	11.42	2/2/2022	9.97	6.36	5.06	ND	NA	5.06
	11.42	3/3/2022	10.01	6.03	5.39	ND	NA	5.39
	11.42	3/7/2022	9.97	5.88	5.54	ND	NA	5.54
	11.42	4/14/2022	10.00	5.82	5.60	ND	N/A	5.60
	11.42	5/11/2022	10.00	5.64	5.78	ND	N/A	5.78
	11.42	5/23/2022	9.98	5.54	5.88	ND	N/A	5.88
	11.42	6/22/2022	10.00	5.29	6.13	ND	NA	6.13

Table 1
34 Berry Street
Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-24	**Historical DTW range: 1.7 - 4.4**							
	Historical LNAPL Thickness range: ND - 0.11							
	11.29	7/13/2016	8.02	2.57	8.72	ND	NA	8.72
	11.29	7/14/2016	NM	2.42	8.87	ND	NA	8.87
	11.29	10/25/2016	8.33	2.46	8.83	ND	NA	8.83
	11.29	10/26/2016	NM	2.67	8.62	ND	NA	8.62
	11.29	1/31/2017	8.08	2.91	8.38	ND	NA	8.38
	11.29	2/1/2017	NM	2.93	8.36	ND	NA	8.36
	11.29	4/25/2017	8.05	2.46	8.83	ND	NA	8.83
	11.29	4/26/2017	NM	4.13	7.16	ND	NA	7.16
	11.29	7/24/2017	8.00	2.43	8.86	ND	NA	8.86
	11.29	7/25/2017	NM	2.60	8.69	ND	NA	8.69
	11.29	10/9/2017	8.03	3.38	7.91	ND	NA	7.91
	11.29	10/10/2017	NM	5.53	5.76	ND	NA	5.76
	11.29	2/1/2018	8.06	4.33	6.96	ND	NA	6.96
	11.29	2/2/2018	8.05	4.31	6.98	ND	NA	6.98
	11.29	4/25/2018	8.08	3.24	8.05	ND	NA	8.05
	11.29	4/26/2018	8.08	3.12	8.17	ND	NA	8.17
	11.29	7/26/2018	8.08	3.34	7.95	3.23	0.11	8.03
	11.29	7/27/2018	8.08	3.35	7.94	3.33	0.02	7.96
	11.29	11/5/2018	8.10	4.40	6.89	4.37	0.03	6.91
	11.29	11/6/2018	8.10	4.29	7.00	ND	NA	7.00
	11.29	6/27/2019	8.02	3.22	8.07	3.19	0.03	8.09
	11.29	6/28/2019	8.02	3.22	8.07	3.20	0.02	8.09
	11.29	9/26/2019	8.06	3.84	7.45	3.82	0.02	7.47
	11.29	9/27/2019	8.06	3.90	7.39	ND	NA	7.39
	11.29	12/30/2019	8.09	3.75	7.54	ND	NA	7.54
	11.29	12/31/2019	8.08	3.74	7.55	ND	NA	7.55
	11.29	6/9/2020	8.03	4.23	7.06	ND	NA	7.06
	11.29	6/10/2020	8.03	4.27	7.02	ND	NA	7.02
	11.29	9/1/2020	8.07	3.65	7.64	3.63	0.02	7.66
	11.29	1/20/2021	8.07	1.68	9.61	ND	NA	9.61
	11.29	6/11/2021	8.02	0.58	10.71	ND	NA	10.71
	11.29	6/16/2021	8.05	0.50	10.79	ND	NA	10.79
	11.29	6/23/2021	8.06	0.50	10.79	ND	NA	10.79
	11.29	6/25/2021	NM	0.50	10.79	ND	NA	10.79
	11.29	7/30/2021	7.94	1.09	10.20	ND	NA	10.20
	11.29	8/6/2021	NM	1.50	9.79	ND	NA	9.79
	11.29	8/10/2021	NM	1.43	9.86	ND	NA	9.86
	11.29	9/14/2021	8.01	0.93	10.36	ND	NA	10.36
	11.29	9/17/2021	NM	1.37	9.92	1.37	Sheen	9.92
	11.29	10/11/2021	8.04	1.18	10.11	ND	NA	10.11
	11.29	10/27/2021	8.02	1.33	9.96	ND	NA	9.96
	11.29	11/10/2021	8.00	1.63	9.66	ND	NA	9.66
	11.29	12/6/2021	8.00	2.02	9.27	ND	NA	9.27
	11.29	12/16/2021	8.06	1.99	9.30	ND	NA	9.30
	11.29	1/10/2022	8.17	2.30	8.99	ND	NA	8.99
	11.29	2/2/2022	8.19	2.28	9.01	ND	NA	9.01
	11.29	3/3/2022	7.99	1.65	9.64	ND	NA	9.64
	11.29	3/7/2022	8.01	1.52	9.77	ND	NA	9.77
	11.29	4/14/2022	8.00	1.88	9.41	ND	N/A	9.41
	11.29	5/11/2022	8.00	1.91	9.38	ND	N/A	9.38
	11.29	5/24/2022	8.06	1.83	9.46	ND	N/A	9.46
	11.29	6/22/2022	8.00	2	9.29	ND	NA	9.29

Table 1
34 Berry Street
Brooklyn, New York
Historic Groundwater Elevations

Well ID	Top of Casing Elevation[1] (feet)	Date	Depth to Bottom of Well (ftbtoc)	Depth to Water (ftbtoc)	Water Table Elevation (feet)	Depth to Product (ftbtoc)	Product Thickness (feet)	Corrected Water Table Elevation[2] (feet)
MW-26	**Historical DTW range: 3.6 - 5.5**							
	Historical LNAPL Thickness range: ND - 0.17							
	11.31	11/5/2018	13.70	5.08	6.23	ND	NA	6.23
	11.31	11/6/2018	13.68	5.02	6.29	ND	NA	6.29
	11.31	6/27/2019	13.68	4.41	6.90	4.25	0.16	7.02
	11.31	6/28/2019	13.68	4.43	6.88	4.29	0.14	6.99
	11.31	9/26/2019	13.70	4.86	6.45	4.79	0.07	6.50
	11.31	9/27/2019	13.70	4.93	6.38	4.87	0.06	6.43
	11.31	12/30/2019	13.74	4.37	6.94	4.35	0.02	6.96
	11.31	12/31/2019	13.72	4.42	6.89	4.40	0.02	6.91
	11.31	6/9/2020	13.35	5.39	5.92	5.30	0.09	5.99
	11.31	6/10/2020	13.35	5.46	5.85	5.35	0.11	5.93
	11.31	9/1/2020	13.69	5.19	6.12	5.16	0.03	6.14
	11.31	1/20/2021	13.67	3.66	7.65	3.49	0.17	7.78
	11.31	6/10/2021	13.66	3.47	7.84	3.47	0.00	7.84
	11.31	6/16/2021	13.68	3.71	7.60	3.54	0.17	7.73
	11.31	6/23/2021	13.68	3.96	7.35	3.80	0.16	7.47
	11.31	6/25/2021	NM	3.82	7.49	3.67	0.15	7.60
	11.31	7/30/2021	NM	NM	NM	NM	NM	NM
	11.31	8/10/2021	NM	4.03	7.28	3.85	0.18	7.42
	11.31	9/14/2021	13.63	3.37	7.94	3.35	0.02	7.96
	11.31	9/17/2021	NM	3.71	7.60	3.60	0.11	7.68
	11.31	10/11/2021	13.72	3.74	7.57	3.60	0.14	7.68
	11.31	10/27/2021	13.61	3.87	7.44	3.68	0.19	7.58
	11.31	11/10/2021	13.69	3.80	7.51	3.65	0.15	7.62
	11.31	12/6/2021	13.61	4.02	7.29	3.98	0.04	7.32
	11.31	12/16/2021	13.66	3.98	7.33	ND	NA	7.33
	11.31	1/10/2022	13.71	4.27	7.04	ND	NA	7.04
	11.31	2/2/2022	13.64	4.21	7.10	ND	NA	7.10
	11.31	3/3/2022	13.34	3.99	7.32	ND	NA	7.32
	11.31	3/7/2022	13.61	3.74	7.57	ND	NA	7.57
	11.31	4/14/2022	13.63	3.92	7.39	ND	N/A	7.39
	11.31	5/11/2022	13.63	3.92	7.39	ND	N/A	7.39
	11.31	5/24/2022	13.63	3.98	7.33	ND	N/A	7.33
	11.31	6/22/2022	13.63	3.82	7.49	ND	NA	7.49

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-02_20200611	MW-3R_20200611	MW-03R_20200902	MW-03R_20210121	MW-04_20200610
	Laboratory Sample ID	460-210934-5	460-210934-4	460-217527-3	460-226972-3	460-210939-2
	Date Sampled	6/11/2020	6/11/2020	9/02/2020	1/21/2021	6/10/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	10	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	10 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	10 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	10 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	**5**	10 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	10 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**2,400**	1 U	1 U	1 U	**30**
1,2-Dichloropropane	**1**	**130**	1 U	1 U	1 U	**12**
2-Hexanone	50	50 U	5 U	5 U	5 U	5 U
Acetone	50	50 U	11	9.8 U	5 U	5 U
Benzene	**1**	10 U	**190**	**350**	1 U	1 U
Bromodichloromethane	50	10 U	1 U	1 U	1 U	1 U
Bromoform	50	10 U	1 U	1 U	1 U	1 U
Bromomethane	5	10 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	10 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	10 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	10 U	1 U	1 U	1 U	1 U
Chloroethane	5	10 U	1 U	1 U	1 U	1 U
Chloroform	7	10 U	1 U	1 U	1 U	1 U
Chloromethane	5	10 U	1 U	1.6	1 U	1 U
Cis-1,2-Dichloroethylene	**5**	10 U	0.31 J	0.37 J	1 U	1 U
Cis-1,3-Dichloropropene	NS	10 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	10 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	10 U	0.44 J	0.54 J	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	50 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	50 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	10 U	1 U	1 U	1 U	1 U
Styrene	5	10 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	10 U	1 U	1 U	1 U	0.27 J
Toluene	5	10 U	1 U	0.41 J	1 U	1 U
Trans-1,2-Dichloroethene	**5**	4.1 J	1 U	1 U	1 U	2.9
Trans-1,3-Dichloropropene	NS	10 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	10 U	1 U	1 U	1 U	2.2
Vinyl Chloride	2	10 U	1 U	1 U	1 U	1 U
Xylenes, Total	NS	20 U	2 U	2 U	2 U	2 U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

AKRF Sample ID		MW-X_20200610	MW-04_20200902	MW-04_20210121	MW-0X_20210121	MW-05_20200611
Laboratory Sample ID		460-210939-3	460-217527-8	460-226972-7	460-226972-6	460-210934-3
Date Sampled		6/10/2020	9/02/2020	1/21/2021	1/21/2021	6/11/2020
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	**5**	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**27**	**32**	**5.3**	**5.2**	**61**
1,2-Dichloropropane	**1**	**9.7**	**12**	**17**	**15**	**3.3**
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U
Acetone	50	8.6	5 U	5 U	5 U	5.4
Benzene	**1**	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U	1 U
Chloroform	7	1 U	1 U	0.37 J	0.35 J	1 U
Chloromethane	5	1 U	1.6	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	**5**	1 U	1 U	1 U	1 U	0.56 J
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	1 U	1 U	1.4
Toluene	5	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	**5**	2.2	1 U	1 U	1 U	4.1
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1.8	2.2	3.7	3.5	1.2
Vinyl Chloride	2	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	NS	2 U	2 U	2 U	2 U	2 U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-05_20200902	MW-05_20210121	MW-06_20200610	MW-06_20210121	MW-07_20200610
	Laboratory Sample ID	460-217527-9	460-226972-4	460-210939-5	460-226972-1	460-210939-6
	Date Sampled	9/02/2020	1/21/2021	6/10/2020	1/21/2021	6/10/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	**5**	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**60**	**24**	1 U	1 U	1 U
1,2-Dichloropropane	**1**	**3.6**	**3.2**	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U
Acetone	50	5 U	5 U	5.2	5 U	5 U
Benzene	**1**	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U	1 U	3
Chloroethane	5	1 U	1 U	1 U	1 U	1 U
Chloroform	7	1 U	1 U	1 U	1 U	1 U
Chloromethane	5	0.9 J	1 UJ	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	**5**	0.4 J	0.37 J	1 U	0.68 J	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	0.38 J	0.37 J	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	**5**	1 U	1 U	**15**	**14**	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	0.89 J	0.83 J	1 U	1 U	1 U
Vinyl Chloride	2	1 U	1 U	1 U	0.47 J	1 U
Xylenes, Total	NS	2 U	2 U	2 U	2 U	2 U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-07_20200902		MW-0X_20200902		MW-08_20200609		MW-08_20200903		MW-09_20200609	
	Laboratory Sample ID	460-217527-5		460-217527-7		460-210690-2		460-217568-3		460-210690-3	
	Date Sampled	9/02/2020		9/02/2020		6/09/2020		9/03/2020		6/09/2020	
	Unit	µg/L		µg/L		µg/L		µg/L		µg/L	
	Dilution Factor	1		1		1		1		1	
Compound	**AWQSGV**	CONC	Q	CONC	Q	CONC	Q	CONC	Q	CONC	Q
1,1,1-Trichloroethane	5	1	U	1	U	1	U	1	U	1	U
1,1,2,2-Tetrachloroethane	5	1	U	1	U	1	U	1	U	1	U
1,1,2-Trichloroethane	1	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethane	**5**	1	U	1	U	1	U	1	U	1	U
1,1-Dichloroethene	5	1	U	1	U	1	U	1	U	1	U
1,2-Dichloroethane	**0.6**	1	U	1	U	1	U	1	U	1	U
1,2-Dichloropropane	**1**	1	U	1	U	1	U	1	U	1	U
2-Hexanone	50	5	U	5	U	5	U	5	U	5	U
Acetone	50	49		47		5	U	5	U	5	U
Benzene	**1**	0.41	J	0.39	J	1	U	1	U	1	U
Bromodichloromethane	50	1	U	1	U	1	U	1	U	1	U
Bromoform	50	1	U	1	U	1	U	1	U	1	U
Bromomethane	5	1	U	1	U	1	U	1	U	1	U
Carbon Disulfide	60	1	U	1	U	1	U	1	U	1	U
Carbon Tetrachloride	5	1	U	1	U	1	U	1	U	1	U
Chlorobenzene	**5**	2.3		2.1		1	U	1	U	1	U
Chloroethane	5	1	U	1	U	1	U	1	U	1	U
Chloroform	7	5.3		4.8		1	U	1	U	1	U
Chloromethane	5	1	U	1	U	1	U	1	U	1	U
Cis-1,2-Dichloroethylene	**5**	1	U	1	U	1	U	1	U	1	U
Cis-1,3-Dichloropropene	NS	1	U	1	U	1	U	1	U	1	U
Dibromochloromethane	50	1	U	1	U	1	U	1	U	1	U
Ethylbenzene	5	1	U	1	U	1	U	1	U	1	U
Methyl Ethyl Ketone (2-Butanone)	50	11		11		5	U	5	U	5	U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5	U	5	U	5	U	5	U	5	U
Methylene Chloride	5	1.3		1.3		1	U	1	U	1	U
Styrene	5	1	U	1	U	1	U	1	U	1	U
Tetrachloroethylene (PCE)	**5**	1	U	1	U	1	U	1	U	1	U
Toluene	5	1	U	1	U	1	U	1	U	1	U
Trans-1,2-Dichloroethene	**5**	1	U	1	U	0.3	J	1	U	0.39	J
Trans-1,3-Dichloropropene	NS	1	U	1	U	1	U	1	U	1	U
Trichloroethylene (TCE)	**5**	1	U	1	U	1	U	1	U	1	U
Vinyl Chloride	2	1	U	1	U	1	U	1	U	1	U
Xylenes, Total	NS	2	U	2	U	2	U	2	U	2	U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-09_20200903	MW-09_20210122	MW-10_20200610	MW-10_20210122	MW-16_20200902
	Laboratory Sample ID	460-217568-2	460-227072-4	460-210939-1	460-227072-3	460-217527-4
	Date Sampled	9/03/2020	1/22/2021	6/10/2020	1/22/2021	9/02/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	**5**	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**1.1**	1 U	1 U	1 U	1 U
1,2-Dichloropropane	**1**	1 U	1 U	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U
Acetone	50	27	5 U	9.8	5 U	5 U
Benzene	**1**	1 U	1 U	1 U	1 U	**1.9**
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U	1 U
Chloroform	7	1 U	1 U	1 U	1 U	1 U
Chloromethane	5	1.5	1 U	1 U	1 U	0.59 J
Cis-1,2-Dichloroethylene	**5**	1 U	1 U	1 U	1 U	0.37 J
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	0.84 J	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	**5**	1 U	1 U	1.2	1 U	**26**
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	2	1 U	1 U	1 U	1 U	0.54 J
Xylenes, Total	NS	2 U	2 U	2 U	2 U	2 U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-16_20210121	MW-18_20200609	MW-18_20200903	MW-18_20210122	MW-20_20200902
	Laboratory Sample ID	460-226972-2	460-210690-1	460-217568-1	460-227072-2	460-217527-13
	Date Sampled	1/21/2021	6/09/2020	9/03/2020	1/22/2021	9/02/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	5	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	5 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	5 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	5 U	1 U	1 U	1 U
1,1-Dichloroethane	**5**	1 U	5 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	5 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	1 U	**1,100**	**310**	**200**	1 U
1,2-Dichloropropane	**1**	1 U	**120**	**37**	**24**	1 U
2-Hexanone	50	5 U	25 U	5 U	5 U	5 U
Acetone	50	5 U	25 U	5 U	5 U	5 U
Benzene	**1**	0.47 J	5 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	5 U	1 U	1 U	1 U
Bromoform	50	1 U	5 U	1 U	1 U	1 U
Bromomethane	5	1 U	5 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	5 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	5 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	5 U	1 U	1 U	1 U
Chloroethane	5	1 U	5 U	1 U	1 U	1 U
Chloroform	7	1 U	5 U	0.72 J	0.71 J	0.68 J
Chloromethane	5	1 U	5 U	4.1	1 U	0.75 J
Cis-1,2-Dichloroethylene	**5**	1 U	5 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	5 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	5 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	5 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	25 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	25 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	5 U	1 U	1 U	1 U
Styrene	5	1 U	5 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	5 U	0.36 J	0.33 J	0.32 J
Toluene	5	1 U	5 U	0.62 J	1 U	1 U
Trans-1,2-Dichloroethene	**5**	1.8	**8.1**	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	5 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	**16**	**7.5**	**6.6**	1 U
Vinyl Chloride	2	1 U	5 U	1 U	1 U	1 U
Xylenes, Total	NS	0.75 J	10 U	2 U	2 U	2 U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-20_20210122	MW-21_20200902	MW-22_20200611	MW-22_20200902	MW-22_20210120
	Laboratory Sample ID	460-227072-1	460-217527-12	460-210934-1	460-217527-11	460-226910-2
	Date Sampled	1/22/2021	9/02/2020	6/11/2020	9/02/2020	1/20/2021
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	**5**	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	1 U	1 U	**13**	**0.74 J**	**10**
1,2-Dichloropropane	**1**	1 U	1 U	0.52 J	1 U	0.41 J
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U
Acetone	50	5 U	5.2 U	6.6	11	5 U
Benzene	**1**	1 U	1 U	1 U	0.27 J	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U	1 U
Chloroform	7	2.2	1 U	1 U	1 U	0.43 J
Chloromethane	5	1 U	1.1	1 U	0.91 J	1 U
Cis-1,2-Dichloroethylene	**5**	1 U	0.29 J	0.47 J	1 U	0.39 J
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	0.49 J	0.31 J	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	**5**	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1 U	0.79 J	1 U	0.59 J
Vinyl Chloride	2	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	NS	2 U	2 U	2 U	2 U	2 U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-22D_20200611	MW-22D_20200902	MW-22D_20210121	MW-22D_20210121	MW-23_20200610
	Laboratory Sample ID	460-210934-2	460-217527-10	460-226972-5	460-226972-5	460-210939-4
	Date Sampled	6/11/2020	9/02/2020	1/21/2021	1/21/2021	6/10/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	5	5	25	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1.6	5 U	1.5 J	NR	1 U
1,1,2,2-Tetrachloroethane	5	1 U	5 U	5 U	NR	1 U
1,1,2-Trichloroethane	1	1 U	5 U	5 U	NR	1 U
1,1-Dichloroethane	**5**	**5.6**	1.5 J	**6.3**	NR	1 U
1,1-Dichloroethene	5	3.1	5 U	2.7 J	NR	1 U
1,2-Dichloroethane	**0.6**	**15**	**1,200**	NR	**4,200 D**	**4.1**
1,2-Dichloropropane	**1**	0.87 J	**45**	**250**	NR	1 U
2-Hexanone	50	5 U	25 U	25 U	NR	5 U
Acetone	50	5.7	25 U	25 U	NR	20
Benzene	**1**	1 U	5 U	5 U	NR	**1.4**
Bromodichloromethane	50	1 U	5 U	5 U	NR	1 U
Bromoform	50	1 U	5 U	5 U	NR	1 U
Bromomethane	5	1 U	5 U	5 U	NR	1 U
Carbon Disulfide	60	1 U	5 U	5 U	NR	1 U
Carbon Tetrachloride	5	1 U	5 U	5 U	NR	1 U
Chlorobenzene	**5**	1 U	5 U	5 U	NR	**7.2**
Chloroethane	5	1 U	5 U	5 U	NR	1 U
Chloroform	7	0.78 J	5 U	3 J	NR	1 U
Chloromethane	5	1 U	5 U	5 UJ	NR	1 U
Cis-1,2-Dichloroethylene	**5**	**7.5**	4.7 J	4.8 J	NR	1 U
Cis-1,3-Dichloropropene	NS	1 U	5 U	5 U	NR	1 U
Dibromochloromethane	50	1 U	5 U	5 U	NR	1 U
Ethylbenzene	5	1 U	5 U	5 U	NR	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	25 U	25 U	NR	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	25 U	25 U	NR	5 U
Methylene Chloride	5	1 U	5 U	5 U	NR	1 U
Styrene	5	1 U	5 U	5 U	NR	1 U
Tetrachloroethylene (PCE)	**5**	**150**	**89**	**96**	NR	1 U
Toluene	5	1 U	5 U	5 U	NR	0.4 J
Trans-1,2-Dichloroethene	**5**	**10**	5 U	5 U	NR	3.1
Trans-1,3-Dichloropropene	NS	1 U	5 U	5 U	NR	1 U
Trichloroethylene (TCE)	**5**	**5.7**	**7.2**	**29**	NR	1 U
Vinyl Chloride	2	1 U	5 U	5 U	NR	1 U
Xylenes, Total	NS	2 U	10 U	10 U	NR	2 U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

AKRF Sample ID		MW-23_20200902	MW-23_20210120	FB-01_20200611	FB_20200902	FB_20210120
Laboratory Sample ID		460-217527-6	460-226910-1	460-210934-7	460-217527-1	460-226910-4
Date Sampled		9/02/2020	1/20/2021	6/11/2020	9/02/2020	1/20/2021
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	**5**	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**3.9**	**8.7**	1 U	1 U	1 U
1,2-Dichloropropane	**1**	1 U	0.45 J	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U
Acetone	50	5.5 U	5 U	5 U	5.3	5 U
Benzene	**1**	**1.8**	**1.3**	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	**5.6**	**8**	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U	1 U
Chloroform	7	1 U	1 U	1 U	1 U	1 U
Chloromethane	5	0.47 J	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	**5**	1 U	1 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	0.34 J	0.33 J	1 U
Styrene	5	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	**5**	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	2	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	NS	2 U	2 U	2 U	2 U	2 U

Table 2A
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	TB-01_20200609	TB_20200902	TB_20210120
	Laboratory Sample ID	460-210690-4	460-217527-2	460-226910-3
	Date Sampled	6/09/2020	9/01/2020	1/20/2021
	Unit	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U
1,1-Dichloroethane	**5**	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	1 U	1 U	1 U
1,2-Dichloropropane	**1**	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U
Acetone	50	5 U	5 U	5 U
Benzene	**1**	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U
Chloroform	7	1 U	1 U	1 U
Chloromethane	5	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	**5**	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	0.32 J
Styrene	5	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U
Trans-1,2-Dichloroethene	**5**	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1 U	1 U
Vinyl Chloride	2	1 U	1 U	1 U
Xylenes, Total	NS	2 U	2 U	2 U

Table 2B
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Semivolatile Organic Compounds (SVOCs)

	AKRF Sample ID	MW-02_20200611	MW-3R_20200611	MW-03R_20200902	MW-03R_20210121	MW-04_20200610
	Laboratory Sample ID	460-210934-5	460-210934-4	460-217527-3	460-226972-3	460-210939-2
	Date Sampled	6/11/2020	6/11/2020	9/02/2020	1/21/2021	6/10/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
2,4-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	NS	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	5	10 U	10 U	10 U	20 U	10 U
3,3'-Dichlorobenzidine	5	10 U	10 U	10 R	20 U	10 U
3-Nitroaniline	5	10 U	10 U	10 UJ	20 U	10 U
4-Bromophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	5	10 U	10 U	10 U	1 U	10 U
4-Chlorophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	5	10 U	10 U	10 UJ	20 U	10 U
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 U	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 U	10 U	10 UJ	10 UJ	10 U
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Benzyl Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy) Methane	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	1 U	1 U	1 U	1 U	1 U
Bis(2-Chloroisopropyl) Ether	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl) Phthalate	**5**	1.9 J	2 U	2 U	1.5 J	2 U
Carbazole	NS	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002	2 U	2 U	2 U	10 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 U	1 UJ	1 UJ	1 U
Dibenzofuran	NS	10 U	10 U	10 U	10 U	10 U
Diethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Dimethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Octylphthalate	50	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	0.91 J	10 U	10 U	10 U	10 U
Hexachlorobenzene	0.04	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5	1 UT	1 UT	1 U	2 U	1 UT
Hexachlorocyclopentadiene	5	10 UT	10 UT	10 U	10 U	10 UT
Hexachloroethane	5	2 U	2 U	2 U	2 U	2 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 U	2 U	2 UJ	2 UJ	2 U
Isophorone	50	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Nitrobenzene	0.4	1 U	1 U	1 U	1 U	1 U
N-Nitrosodi-N-Propylamine	NS	1 U	1 U	1 U	1 U	1 U
N-Nitrosodiphenylamine	50	10 U	10 U	10 U	10 U	10 U
Phenanthrene	50	10 U	10 U	10 U	10 U	10 U
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 2B
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Semivolatile Organic Compounds (SVOCs)

	AKRF Sample ID	MW-X_20200610		MW-04_20200902		MW-04_20210121		MW-0X_20210121		MW-05_20200611	
	Laboratory Sample ID	460-210939-3		460-217527-8		460-226972-7		460-226972-6		460-210934-3	
	Date Sampled	6/10/2020		9/02/2020		1/21/2021		1/21/2021		6/11/2020	
	Unit	µg/L		µg/L		µg/L		µg/L		µg/L	
	Dilution Factor	1		1		1		1		1	
Compound	**AWQSGV**	CONC	Q	CONC	Q	CONC	Q	CONC	Q	CONC	Q
2,4-Dinitrotoluene	5	2	U	2	U	2	U	2	U	2	U
2,6-Dinitrotoluene	5	2	U	2	U	2	U	2	U	2	U
2-Chloronaphthalene	10	10	U	10	U	10	U	10	U	10	U
2-Methylnaphthalene	NS	10	U	10	U	10	U	10	U	10	U
2-Nitroaniline	5	10	U	10	U	20	U	20	U	10	U
3,3'-Dichlorobenzidine	5	10	U	10	U	20	U	20	U	10	U
3-Nitroaniline	5	10	U	10	U	20	U	20	U	10	U
4-Bromophenyl Phenyl Ether	NS	10	U	10	U	10	U	10	U	10	U
4-Chloroaniline	5	10	U	10	U	1	U	1	U	10	U
4-Chlorophenyl Phenyl Ether	NS	10	U	10	U	10	U	10	U	10	U
4-Nitroaniline	5	10	U	10	UJ	20	U	20	U	10	U
Acenaphthene	20	10	U	10	U	10	U	10	U	10	U
Acenaphthylene	NS	10	U	10	U	10	U	10	U	10	U
Anthracene	50	10	U	10	U	10	U	10	U	10	U
Benzo(a)Anthracene	0.002	1	U	1	U	1	U	1	U	1	U
Benzo(a)Pyrene	ND	1	U	1	U	1	U	1	U	1	U
Benzo(b)Fluoranthene	0.002	2	U	2	U	2	U	2	U	2	U
Benzo(g,h,i)Perylene	NS	10	U	10	UJ	10	UJ	10	UJ	10	U
Benzo(k)Fluoranthene	0.002	1	U	1	U	1	U	1	U	1	U
Benzyl Butyl Phthalate	50	10	U	10	U	10	U	10	U	10	U
Bis(2-Chloroethoxy) Methane	5	10	U	10	U	10	U	10	U	10	U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	1	U	1	U	1	U	1	U	1	U
Bis(2-Chloroisopropyl) Ether	5	10	UT	10	U	10	U	10	U	10	U
Bis(2-Ethylhexyl) Phthalate	**5**	2	U	2	U	10	U	10	U	2	U
Carbazole	NS	10	U	10	U	10	U	10	U	10	U
Chrysene	0.002	2	U	2	U	10	U	10	U	2	U
Dibenz(a,h)Anthracene	NS	1	U	1	UJ	1	UJ	1	UJ	1	U
Dibenzofuran	NS	10	U	10	U	10	U	10	U	10	U
Diethyl Phthalate	50	10	U	10	U	10	U	10	U	10	U
Dimethyl Phthalate	50	10	U	10	U	10	U	10	U	10	U
Di-N-Butyl Phthalate	50	10	U	10	U	10	U	10	U	10	U
Di-N-Octylphthalate	50	10	U	10	U	10	U	10	U	10	U
Fluoranthene	50	10	U	10	U	10	U	10	U	10	U
Fluorene	50	10	U	10	U	10	U	10	U	10	U
Hexachlorobenzene	0.04	1	U	1	U	1	U	1	U	1	U
Hexachlorobutadiene	0.5	1	UT	1	U	2	U	2	U	1	UT
Hexachlorocyclopentadiene	5	10	U	10	U	10	U	10	U	10	UT
Hexachloroethane	5	2	U	2	U	2	U	2	U	2	U
Indeno(1,2,3-c,d)Pyrene	0.002	2	U	2	UJ	2	UJ	2	UJ	2	U
Isophorone	50	10	U	10	U	10	U	10	U	10	U
Naphthalene	10	2	U	2	U	2	U	2	U	2	U
Nitrobenzene	0.4	1	U	1	U	1	U	1	U	1	U
N-Nitrosodi-N-Propylamine	NS	1	U	1	U	1	U	1	U	1	U
N-Nitrosodiphenylamine	50	10	U	10	U	10	U	10	U	10	U
Phenanthrene	50	10	U	10	U	10	U	10	U	10	U
Pyrene	50	10	U	10	U	10	U	10	U	10	U

Table 2B
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Semivolatile Organic Compounds (SVOCs)

	AKRF Sample ID	MW-05_20200902	MW-05_20210121	MW-06_20200610	MW-06_20210121	MW-07_20200610
	Laboratory Sample ID	460-217527-9	460-226972-4	460-210939-5	460-226972-1	460-210939-6
	Date Sampled	9/02/2020	1/21/2021	6/10/2020	1/21/2021	6/10/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
2,4-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	NS	10 U	10 U	3.1 J	4 J	10 U
2-Nitroaniline	5	10 U	20 U	10 U	20 U	10 U
3,3'-Dichlorobenzidine	5	10 U	20 U	10 U	20 U	10 U
3-Nitroaniline	5	10 U	20 U	10 U	20 U	10 U
4-Bromophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	5	10 U	1 U	10 U	1 U	10 U
4-Chlorophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	5	10 UJ	20 U	10 U	20 U	10 U
Acenaphthene	20	10 U	10 U	1.3 J	1.6 J	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 U	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 UJ	10 UJ	10 U	10 UJ	10 U
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Benzyl Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy) Methane	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	1 U	1 U	1 U	1 U	1 U
Bis(2-Chloroisopropyl) Ether	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl) Phthalate	**5**	2 U	10 U	**6.9**	**7.7 J**	2 U
Carbazole	NS	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002	2 U	10 U	2 U	10 U	2 U
Dibenz(a,h)Anthracene	NS	1 UJ	1 UJ	1 U	1 UJ	1 U
Dibenzofuran	NS	10 U	10 U	1.7 J	2.2 J	1.6 J
Diethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Dimethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Butyl Phthalate	50	10 U	10 U	2.3 J	10 U	10 U
Di-N-Octylphthalate	50	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	10 U	10 U	4.7 J	6 J	5.6 J
Hexachlorobenzene	0.04	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5	1 U	2 U	1 UT	2 U	1 UT
Hexachlorocyclopentadiene	5	10 U	10 U	10 UT	10 U	10 UT
Hexachloroethane	5	2 U	2 U	2 U	2 U	2 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 UJ	2 U	2 UJ	2 U
Isophorone	50	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Nitrobenzene	0.4	1 U	1 U	1 U	1 U	1 U
N-Nitrosodi-N-Propylamine	NS	1 U	1 U	1 U	1 U	1 U
N-Nitrosodiphenylamine	50	10 U	10 U	10 U	10 U	10 U
Phenanthrene	50	10 U	10 U	2.6 J	3.9 J	5.4 J
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 2B
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Semivolatile Organic Compounds (SVOCs)

	AKRF Sample ID	MW-07_20200902	MW-0X_20200902	MW-08_20200609	MW-09_20200609	MW-10_20200610
	Laboratory Sample ID	460-217527-5	460-217527-7	460-210690-2	460-210690-3	460-210939-1
	Date Sampled	9/02/2020	9/02/2020	6/09/2020	6/09/2020	6/10/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
2,4-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	NS	1.4 J	1.2 J	10 U	10 U	10 U
2-Nitroaniline	5	10 U	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	5	10 U	10 U	10 U	10 U	10 U
3-Nitroaniline	5	10 U	10 U	10 U	10 U	10 U
4-Bromophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	5	10 U	10 U	10 U	10 U	10 U
4-Chlorophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	5	10 UJ	10 UJ	10 U	10 U	10 U
Acenaphthene	20	10 U	10 U	1.6 J	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 U	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 UJ	10 UJ	10 U	10 U	10 U
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Benzyl Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy) Methane	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	1 U	1 U	1 U	1 U	1 U
Bis(2-Chloroisopropyl) Ether	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl) Phthalate	**5**	2 U	2 U	2 U	2 U	2 U
Carbazole	NS	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002	2 U	2 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 UJ	1 UJ	1 U	1 U	1 U
Dibenzofuran	NS	1.3 J	1.1 J	10 U	10 U	1.5 J
Diethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Dimethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Octylphthalate	50	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	3.8 J	3.2 J	6.4 J	0.94 J	2.7 J
Hexachlorobenzene	0.04	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5	1 U	1 U	1 U	1 U	1 UT
Hexachlorocyclopentadiene	5	10 U	10 U	10 U	10 U	10 UT
Hexachloroethane	5	2 U	2 U	2 U	2 U	2 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 UJ	2 U	2 U	2 U
Isophorone	50	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Nitrobenzene	0.4	1 U	1 U	1 U	1 U	1 U
N-Nitrosodi-N-Propylamine	NS	1 U	1 U	1 U	1 U	1 U
N-Nitrosodiphenylamine	50	10 U	10 U	10 U	10 U	10 U
Phenanthrene	50	4.4 J	3.7 J	10 U	10 U	0.75 J
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 2B
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Semivolatile Organic Compounds (SVOCs)

	AKRF Sample ID	MW-16_20200902	MW-16_20210121	MW-18_20200609	MW-22_20200611	MW-22_20200902
	Laboratory Sample ID	460-217527-4	460-226972-2	460-210690-1	460-210934-1	460-217527-11
	Date Sampled	9/02/2020	1/21/2021	6/09/2020	6/11/2020	9/02/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
2,4-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	NS	10 U	0.99 J	10 U	10 U	10 U
2-Nitroaniline	5	10 U	20 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	5	10 U	20 U	10 U	10 U	10 U
3-Nitroaniline	5	10 U	20 U	10 U	10 U	10 U
4-Bromophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	5	10 U	1 U	10 U	10 U	10 U
4-Chlorophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	5	10 UJ	20 U	10 U	10 U	10 UJ
Acenaphthene	20	3 J	2.5 J	10 U	10 U	10 U
Acenaphthylene	NS	10 U	0.99 J	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 U	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 UJ	10 UJ	10 U	10 U	10 UJ
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Benzyl Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy) Methane	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	1 U	1 U	1 U	1 U	1 U
Bis(2-Chloroisopropyl) Ether	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl) Phthalate	**5**	2.7	**12**	2 U	**12**	2 U
Carbazole	NS	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002	2 U	10 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 UJ	1 UJ	1 U	1 U	1 UJ
Dibenzofuran	NS	3.1 J	3.7 J	10 U	10 U	10 U
Diethyl Phthalate	50	10 U	10 U	10 U	10 U	1 J
Dimethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Butyl Phthalate	50	10 U	10 U	10 U	10 U	1.1 J
Di-N-Octylphthalate	50	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	6.5 J	9.2 J	10 U	1.6 J	10 U
Hexachlorobenzene	0.04	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5	1 U	2 U	1 U	1 UT	1 U
Hexachlorocyclopentadiene	5	10 U	10 U	10 U	10 UT	10 U
Hexachloroethane	5	2 U	2 U	2 U	2 U	2 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 UJ	2 U	2 U	2 UJ
Isophorone	50	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	2 U	1 J	2 U	2 U	2 U
Nitrobenzene	0.4	1 U	1 U	1 U	1 U	1 U
N-Nitrosodi-N-Propylamine	NS	1 U	1 U	1 U	1 U	1 U
N-Nitrosodiphenylamine	50	10 U	10 U	10 U	10 U	10 U
Phenanthrene	50	1.8 J	2 J	10 U	3.5 J	10 U
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 2B
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Semivolatile Organic Compounds (SVOCs)

	AKRF Sample ID	MW-22_20210120	MW-22D_20200611	MW-22D_20200902	MW-22D_20210121	MW-23_20200610
	Laboratory Sample ID	460-226910-2	460-210934-2	460-217527-10	460-226972-5	460-210939-4
	Date Sampled	1/20/2021	6/11/2020	9/02/2020	1/21/2021	6/10/2020
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
2,4-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	NS	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	5	20 U	10 U	10 U	20 U	10 U
3,3'-Dichlorobenzidine	5	20 U	10 U	10 U	20 U	10 U
3-Nitroaniline	5	20 U	10 U	10 U	20 U	10 U
4-Bromophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	5	1 U	10 U	10 U	1 U	10 U
4-Chlorophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	5	20 U	10 U	10 UJ	20 U	10 U
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 U	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 U	10 U	10 UJ	10 UJ	10 U
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Benzyl Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy) Methane	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	1 U	1 U	1 U	1 U	1 U
Bis(2-Chloroisopropyl) Ether	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl) Phthalate	**5**	10 U	2 U	2 U	10 U	2 U
Carbazole	NS	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002	10 U	2 U	2 U	10 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 U	1 UJ	1 UJ	1 U
Dibenzofuran	NS	10 U	10 U	10 U	10 U	10 U
Diethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Dimethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Octylphthalate	50	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	10 U	10 U	10 U	10 U	1.6 J
Hexachlorobenzene	0.04	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5	2 U	1 UT	1 U	2 U	1 UT
Hexachlorocyclopentadiene	5	10 U	10 UT	10 U	10 U	10 UT
Hexachloroethane	5	2 U	2 U	2 U	2 U	2 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 U	2 U	2 UJ	2 UJ	2 U
Isophorone	50	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Nitrobenzene	0.4	1 U	1 U	1 U	1 U	1 U
N-Nitrosodi-N-Propylamine	NS	1 U	1 U	1 U	1 U	1 U
N-Nitrosodiphenylamine	50	10 U	10 U	10 U	10 U	10 U
Phenanthrene	50	10 U	10 U	10 U	10 U	10 U
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 2B
34 Berry Street
Brooklyn, New York
Baseline Groundwater Sampling
Analytical Results of Semivolatile Organic Compounds (SVOCs)

	AKRF Sample ID	MW-23_20200902	MW-23_20210120	FB-01_20200611	FB_20200902	FB_20210120
	Laboratory Sample ID	460-217527-6	460-226910-1	460-210934-7	460-217527-1	460-226910-4
	Date Sampled	9/02/2020	1/20/2021	6/11/2020	9/02/2020	1/20/2021
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
2,4-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2,6-Dinitrotoluene	5	2 U	2 U	2 U	2 U	2 U
2-Chloronaphthalene	10	10 U	10 U	10 U	10 U	10 U
2-Methylnaphthalene	NS	10 U	10 U	10 U	10 U	10 U
2-Nitroaniline	5	10 U	20 U	10 U	10 U	20 U
3,3'-Dichlorobenzidine	5	10 U	20 U	10 U	10 U	20 U
3-Nitroaniline	5	10 U	20 U	10 U	10 U	20 U
4-Bromophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Chloroaniline	5	10 U	1 U	10 U	10 U	1 U
4-Chlorophenyl Phenyl Ether	NS	10 U	10 U	10 U	10 U	10 U
4-Nitroaniline	5	10 UJ	20 U	10 U	10 UJ	20 U
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 U	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 UJ	10 U	10 U	10 UJ	10 U
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Benzyl Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethoxy) Methane	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Chloroethyl) Ether (2-Chloroethyl Ether)	1	1 U	1 U	1 U	1 U	1 U
Bis(2-Chloroisopropyl) Ether	5	10 U	10 U	10 U	10 U	10 U
Bis(2-Ethylhexyl) Phthalate	**5**	2 U	10 U	2 U	2 U	10 U
Carbazole	NS	10 U	10 U	10 U	10 U	10 U
Chrysene	0.002	2 U	10 U	2 U	2 U	10 U
Dibenz(a,h)Anthracene	NS	1 UJ	1 U	1 U	1 UJ	1 U
Dibenzofuran	NS	10 U	1.5 J	10 U	10 U	10 U
Diethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Dimethyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Butyl Phthalate	50	10 U	10 U	10 U	10 U	10 U
Di-N-Octylphthalate	50	10 U	10 U	10 U	10 U	10 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	10 U	10 U	10 U	10 U	10 U
Hexachlorobenzene	0.04	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	0.5	1 U	2 U	1 UT	1 U	2 U
Hexachlorocyclopentadiene	5	10 U	10 U	10 UT	10 U	10 U
Hexachloroethane	5	2 U	2 U	2 U	2 U	2 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 U	2 U	2 UJ	2 U
Isophorone	50	10 U	10 U	10 U	10 U	10 U
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Nitrobenzene	0.4	1 U	1 U	1 U	1 U	1 U
N-Nitrosodi-N-Propylamine	NS	1 U	1 U	1 U	1 U	1 U
N-Nitrosodiphenylamine	50	10 U	10 U	10 U	10 U	10 U
Phenanthrene	50	10 U	10 U	10 U	10 U	10 U
Pyrene	50	10 U	10 U	10 U	10 UJ	10 U

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-01_20210915	MW-01_20220111	MW-01_20220524	MW-0X_20220524	MW-03R_20210914	MW-03R_20220111	MW-3R_20220524	MW-04_20210915
	Laboratory Sample ID	460-242848-2	460-250593-7	460-258853-4	460-258853-5	460-242758-5	460-250593-11	460-258853-3	460-242848-3
	Date Sampled	9/15/2021	1/11/2022	05/24/2022	05/24/2022	9/14/2021	1/11/2022	05/24/2022	9/15/2021
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	2	1	1	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	2 U	1 U	1 U	1 U	1 U	1 UJ	1 U	1 U
1,1,2-Trichloroethane	1	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	2 U	**120**	1 U	1 U	1 U	**1.4**	1 U	**10**
1,2-Dichloropropane	**1**	2 U	**1.1**	1 U	1 U	1 U	1 U	1 U	**3.5**
2-Hexanone	50	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	**50**	**1,800**	5 U	11	11	5 U	5 U	5 U	5 U
Benzene	**1**	2 U	1 U	1 U	1 U	**1.5**	**82**	1 U	1 U
Bromodichloromethane	50	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	50	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	2 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	**7**	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	2 U	0.39 J	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	2 U	1 U	1 U	1 U	1 U	0.33 J	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5.1 J	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	10 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	5	2 U	1 U	1 U	1 U	1 U	0.39 J	1 U	1 U
Trans-1,2-Dichloroethene	5	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1.2
Vinyl Chloride	2	2 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	NS	0.96 J	2 U	1 U	1 U	1 U	2 U	1 U	1 U

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-0X_20210915	MW-04_20220111	MW-0X_20220111	MW-04_20220524	MW-05_20210915	MW-05_20220111	MW-05_20220524	MW-06_20210914
	Laboratory Sample ID	460-242848-6	460-250593-4	460-250593-5	460-258853-1	460-242848-4	460-250593-6	460-258853-2	460-242758-4
	Date Sampled	9/15/2021	1/11/2022	1/11/2022	05/24/2022	9/15/2021	1/11/2022	05/24/2022	9/14/2021
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 UJ	1 UJ	1 U	1 U	1 UJ	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**10**	**2.8**	**4.2**	**6**	**24**	**45**	**290**	1 U
1,2-Dichloropropane	**1**	**3.4**	1 U	0.49 J	**2**	**1.3**	**3.5**	**18**	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	**50**	5 U	5 U	5 U	5 U	5 U	5 U	5 U	**79**
Benzene	**1**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.47 J
Chloroform	**7**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	5	1 U	1 U	1 U	1 U	0.59 J	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	1 U	1 U	1 U	1 U	1 U	0.29 J	0.45 J	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	1 U	1 U	0.5 J	0.4 J	0.50 J	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1.2	1 U	0.37 J	0.81 J	0.77 J	1	2.7	1 U
Vinyl Chloride	2	1 U	1 UJ	1 UJ	1 U	1 U	1 UJ	1 U	1 U
Xylenes, Total	NS	1 U	2 U	2 U	1 U	1 U	2 U	1 U	0.57 J

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-06_20220111	MW-06_20220524	MW-07_20210915	MW-07_20220111	MW-07_20220523	MW-08_20210916	MW-08_20220112	MW-08_20220525
	Laboratory Sample ID	460-250593-9	460-258853-6	460-242848-5	460-250593-8	460-258686-4	460-242935-4	460-250628-4	460-258853-11
	Date Sampled	1/11/2022	05/24/2022	9/15/2021	1/11/2022	05/23/2022	9/16/2021	1/12/2022	05/25/2022
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**120**	1 U	1 U	**1.7**	1 U	1 U	1 U	1 U
1,2-Dichloropropane	**1**	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	**50**	5 U	38	**76**	5 U	5 U	5 U	5 U	5 U
Benzene	**1**	1 U	1 U	0.69 J	**3.8**	**2.1**	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U	1 U	0.5 J	0.46 J
Bromoform	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	0.99 J	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	4.2	**8.3**	**7.2**	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	**7**	1 U	1 U	1 U	1 U	1 U	1 U	**9.6**	**9.7**
Chloromethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	0.36 J	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	4.2 J	5 U	5 U	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	0.44 J	0.6 J	0.57 J	1 U	1 U	1 U
Trans-1,2-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Vinyl Chloride	2	1 UJ	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U
Xylenes, Total	NS	2 U	2 U	1 U	2 U	1 U	2 U	2 U	2 U

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-09_20210916	MW-09_20220112	MW-09_20220525	MW-10_20210916	MW-10_20220112	MW-10_20220525	MW-16_20210914	MW-16_20210914
	Laboratory Sample ID	460-242935-3	460-250628-3	460-258853-12	460-242935-2	460-250628-2	460-258853-13	460-242758-3	460-242758-3
	Date Sampled	9/16/2021	1/12/2022	05/25/2022	9/16/2021	1/12/2022	05/25/2022	9/14/2021	9/14/2021
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1	1	1	5
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
1,2-Dichloroethane	**0.6**	1 U	1 U	1 U	1 U	0.43 J	1 U	1 U	NR
1,2-Dichloropropane	**1**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NR
Acetone	**50**	5 U	5 U	5 U	5.3	5 U	5 U	NR	**3,600 D**
Benzene	**1**	0.62 J	0.45 J	1 U	1 U	1 U	1 U	1 U	NR
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Bromoform	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Bromomethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Carbon Disulfide	60	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Chlorobenzene	**5**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Chloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Chloroform	**7**	1 U	1 U	0.62 J	1 U	1 U	1 U	0.47 J	NR
Chloromethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Cis-1,2-Dichloroethylene	5	0.39 J	0.3 J	1 U	0.31 J	1 U	0.31 J	1 U	NR
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U	5 U	5 U	4.5 J	NR
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	1.6 J	5 U	5 U	5 U	5 U	5 U	NR
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Styrene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Tetrachloroethylene (PCE)	**5**	1.3	1 U	0.59 J	1 U	1 U	1 U	1 U	NR
Toluene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Trans-1,2-Dichloroethene	5	1 U	0.58 J	1 U	1 U	1 U	1 U	1 U	NR
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NR
Trichloroethylene (TCE)	**5**	0.49 J	1 U	1 U	0.37 J	0.46 J	1 U	1 U	NR
Vinyl Chloride	2	0.24 J	0.46 J	1 U	1 U	1 U	1 U	1 U	NR
Xylenes, Total	NS	2 U	2 U	2 U	2 U	2 U	1 U	0.4 J	NR

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-16_20220111	MW-16_20220524	MW-17_20210915	MW-17_20220111
	Laboratory Sample ID	460-250593-10	460-258853-7	460-242848-7	460-250593-13
	Date Sampled	1/11/2022	05/24/2022	9/15/2021	1/11/2022
	Unit	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 U	1 UJ
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**120**	1 U	1 U	1 U
1,2-Dichloropropane	**1**	1	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U
Acetone	**50**	5 U	6.3	5 U	5 U
Benzene	**1**	1 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U
Chloroform	**7**	1 U	1 U	1 U	1 U
Chloromethane	5	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	0.37 J	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	5	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1 U	1 U	1 U
Vinyl Chloride	2	1 UJ	1 U	1 U	1 U
Xylenes, Total	NS	2 U	1 U	1 U	2 U

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-17_20220525	MW-18_20210916	MW-18_20220111	MW-18_20220525	MW-20_20210916	MW-20_20220112	MW-20_20220525	MW-22_20210914
	Laboratory Sample ID	460-258853-8	460-242935-1	460-250593-16	460-258853-9	460-242935-5	460-250628-1	460-258853-10	460-242758-2
	Date Sampled	05/25/2022	9/16/2021	1/11/2022	05/25/2022	9/16/2021	1/12/2022	05/25/2022	9/14/2021
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 UJ	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	1 U	**12**	**46**	**1.1**	1 U	1 U	1 U	**4.4**
1,2-Dichloropropane	**1**	1 U	**4.3**	**7.4**	1 U	1 U	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	**50**	5 U	5 U	5 U	**170**	5 U	5 U	**190**	5 U
Benzene	**1**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	**7**	1 U	0.6 J	0.41 J	2.4	4.9	7	**22**	1 U
Chloromethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	3.4 J	5 U	5 U	6.2	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U	1 U	1 U	0.79 J	1 U
Styrene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	0.32 J	1 U	0.35 J	0.33 J	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U	1 U	1 U	1.2	1 U
Trans-1,2-Dichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1.2	2.2	0.38 J	1 U	1 U	0.36 J	1 U
Vinyl Chloride	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	NS	2 U	2 U	2 U	2 U	2 U	2 U	1 U	1 U

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-22D_20210915	MW-22_20220111	MW-22D_20220111	MW-22D_20220111	MW-22_20220523	MW-22D_20220523	MW-23_20210914	MW-23_20220111
	Laboratory Sample ID	460-242848-1	460-250593-1	460-250593-3	460-250593-3	460-258686-1	460-258686-2	460-242758-1	460-250593-2
	Date Sampled	9/15/2021	1/11/2022	1/11/2022	1/11/2022	05/23/2022	05/23/2022	9/14/2021	1/11/2022
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	5	1	5	50	1	10	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	5 U	1 UJ	5 UJ	NR	1 U	10 U	1 U	1 UJ
1,1,2-Trichloroethane	1	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
1,1-Dichloroethane	5	2 J	1 U	3.1 J	NR	1 U	4.1 J	1 U	1 U
1,1-Dichloroethene	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**990**	**5**	NR	**19,000 D**	1 U	**2,700**	**3.9**	**1.8**
1,2-Dichloropropane	**1**	**45**	1 U	**1,000**	NR	1 U	**160**	1 U	1 U
2-Hexanone	50	25 U	5 U	25 U	NR	5 U	50 U	5 U	5 U
Acetone	**50**	25 U	5 U	25 U	NR	5 U	50 U	5 U	5 U
Benzene	**1**	5 U	1 U	5 U	NR	1 U	10 U	0.63 J	0.51 J
Bromodichloromethane	50	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Bromoform	50	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Bromomethane	5	5 UJ	1 U	5 U	NR	1 U	10 U	1 U	1 U
Carbon Disulfide	60	5 U	1 U	5 U	NR	0.93 J	10 U	1 U	1 U
Carbon Tetrachloride	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Chlorobenzene	**5**	5 U	1 U	5 U	NR	1 U	10 U	**5.1**	2.5
Chloroethane	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Chloroform	**7**	5 U	1 U	**8.7**	NR	1 U	10 U	1 U	1 U
Chloromethane	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	2.2 J	1 U	2.7 J	NR	1 U	3.5 J	1 U	1 U
Cis-1,3-Dichloropropene	NS	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Dibromochloromethane	50	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Ethylbenzene	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	25 U	5 U	25 U	NR	5 U	50 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	25 U	5 U	25 U	NR	5 U	50 U	5 U	5 U
Methylene Chloride	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Styrene	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	**47**	1 U	5 U	NR	1 U	**51**	1 U	1 U
Toluene	5	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Trans-1,2-Dichloroethene	5	5 U	1 U	1.7 J	NR	1 U	10 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	5 U	1 U	5 U	NR	1 U	10 U	1 U	1 U
Trichloroethylene (TCE)	**5**	**6.8**	0.41 J	**110**	NR	1 U	**27**	1 U	1 U
Vinyl Chloride	2	5 U	1 UJ	5 UJ	NR	1 U	10 U	1 U	1 UJ
Xylenes, Total	NS	5 U	2 U	10 U	NR	1 U	10 U	1 U	2 U

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	MW-23_20220523	MW-24_20210914	MW-24_20220111	FB-01_20220111
	Laboratory Sample ID	460-258686-3	460-242758-6	460-250593-12	460-250593-14
	Date Sampled	05/23/2022	9/14/2021	1/11/2022	1/11/2022
	Unit	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 UJ	1 UJ
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	**2.8**	**0.75 J**	0.55 J	1 U
1,2-Dichloropropane	**1**	1 U	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U
Acetone	**50**	5 U	5 U	17	5 U
Benzene	**1**	0.81 J	**99**	**82**	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	**5.4**	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U
Chloroform	**7**	1 U	1 U	1 U	1 U
Chloromethane	5	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	1 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	0.3 J	0.49 J	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	4.8 J	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	1 U	1 U
Toluene	5	1 U	0.71 J	0.72 J	1 U
Trans-1,2-Dichloroethene	5	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1 U	1 U	1 U
Vinyl Chloride	2	1 U	1 U	1 U	1 UJ
Xylenes, Total	NS	1 U	2.2	3.1	2 U

Table 3A
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

	AKRF Sample ID	FB-01_20220523	TB_20210914	TB-01_20220111	TB-01_20220523
	Laboratory Sample ID	460-258686-6	460-242758-8	460-250593-15	460-258686-7
	Date Sampled	05/23/2022	9/14/2021	1/11/2022	05/23/2022
	Unit	µg/L	µg/L	µg/L	µg/L
	Dilution Factor	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	5	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	5	1 U	1 U	1 UJ	1 U
1,1,2-Trichloroethane	1	1 U	1 U	1 U	1 U
1,1-Dichloroethane	5	1 U	1 U	1 U	1 U
1,1-Dichloroethene	5	1 U	1 U	1 U	1 U
1,2-Dichloroethane	**0.6**	1 U	1 U	1 U	1 U
1,2-Dichloropropane	**1**	1 U	1 U	1 U	1 U
2-Hexanone	50	5 U	5 U	5 U	5 U
Acetone	**50**	5 U	5 U	5 U	5 U
Benzene	**1**	1 U	1 U	1 U	1 U
Bromodichloromethane	50	1 U	1 U	1 U	1 U
Bromoform	50	1 U	1 U	1 U	1 U
Bromomethane	5	1 U	1 U	1 U	1 U
Carbon Disulfide	60	1 U	1 U	1 U	1 U
Carbon Tetrachloride	5	1 U	1 U	1 U	1 U
Chlorobenzene	**5**	1 U	1 U	1 U	1 U
Chloroethane	5	1 U	1 U	1 U	1 U
Chloroform	**7**	1 U	1 U	1 U	1 U
Chloromethane	5	1 U	1 U	1 U	1 U
Cis-1,2-Dichloroethylene	5	1 U	1 U	1 U	1 U
Cis-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U
Dibromochloromethane	50	1 U	1 U	1 U	1 U
Ethylbenzene	5	1 U	1 U	1 U	1 U
Methyl Ethyl Ketone (2-Butanone)	50	5 U	5 U	5 U	5 U
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	NS	5 U	5 U	5 U	5 U
Methylene Chloride	5	1 U	1 U	1 U	1 U
Styrene	5	1 U	1 U	1 U	1 U
Tetrachloroethylene (PCE)	**5**	1 U	1 U	1 U	1 U
Toluene	5	1 U	1 U	1 U	1 U
Trans-1,2-Dichloroethene	5	1 U	1 U	1 U	1 U
Trans-1,3-Dichloropropene	NS	1 U	1 U	1 U	1 U
Trichloroethylene (TCE)	**5**	1 U	1 U	1 U	1 U
Vinyl Chloride	2	1 U	1 U	1 UJ	1 U
Xylenes, Total	NS	2 U	1 U	2 U	2 U

Table 3B
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Semivolatile Organic Compounds (SVOCs)

AKRF Sample ID		MW-01_20210915	MW-01_20220111	MW-01_20220524	MW-03R_20210914	MW-03R_20220111
Laboratory Sample ID		460-242848-2	460-250593-7	460-258853-4	460-242758-5	460-250593-11
Date Sampled		9/15/2021	1/11/2022	05/24/2022	9/14/2021	1/11/2022
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 UJ	1 U	1 U	1 UJ	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 U	10 UJ	10 UJ	10 U	10 UJ
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Chrysene	0.002	2 U	2 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 U	1 U	1 U	1 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 UJ	2 U	2 U	2 UJ
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Phenanthrene	50	10 U	10 U	10 U	10 U	10 U
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 3B
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Semivolatile Organic Compounds (SVOCs)

AKRF Sample ID		MW-3R_20220524	MW-0X_20220524	MW-04_20210915	MW-0X_20210915	MW-04_20220111
Laboratory Sample ID		460-258853-3	460-258853-5	460-242848-3	460-242848-6	460-250593-4
Date Sampled		05/24/2022	05/24/2022	9/15/2021	9/15/2021	1/11/2022
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 UJ	1 UJ	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 UJ	10 U	10 U	10 U	10 UJ
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Chrysene	0.002	2 U	2 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 U	1 U	1 U	1 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 U	2 U	2 U	2 UJ
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Phenanthrene	50	10 U	10 U	10 U	10 U	10 U
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 3B
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Semivolatile Organic Compounds (SVOCs)

AKRF Sample ID		MW-0X_20220111	MW-04_20220524	MW-05_20210915	MW-05_20220111	MW-05_20220524
Laboratory Sample ID		460-250593-5	460-258853-1	460-242848-4	460-250593-6	460-258853-2
Date Sampled		1/11/2022	05/24/2022	9/15/2021	1/11/2022	05/24/2022
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 UJ	1 U	1 U	1 UJ
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 UJ	10 U	10 U	10 UJ	10 U
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Chrysene	0.002	2 U	2 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 U	1 U	1 U	1 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 U	2 UJ	2 UJ	2 U
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Phenanthrene	50	10 U	10 U	10 U	10 U	10 U
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 3B
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Semivolatile Organic Compounds (SVOCs)

AKRF Sample ID		MW-06_20210914	MW-06_20220111	MW-06_20220524	MW-07_20210915	MW-07_20220111
Laboratory Sample ID		460-242758-4	460-250593-9	460-258853-6	460-242848-5	460-250593-8
Date Sampled		9/14/2021	1/11/2022	05/24/2022	9/15/2021	1/11/2022
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 UJ	1 U	1 UJ	1 UJ	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 U	10 UJ	10 U	10 U	10 UJ
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Chrysene	0.002	2 U	2 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 U	1 U	1 U	1 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	10 U	10 U	10 U	5.5 J	2.3 J
Indeno(1,2,3-c,d)Pyrene	0.002	2 U	2 UJ	2 U	2 U	2 UJ
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Phenanthrene	50	10 U	10 U	10 U	6.1 J	10 U
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 3B
34 Berry Street
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Remedial Action Groundwater Sampling Results
Analytical Results of Semivolatile Organic Compounds (SVOCs)

AKRF Sample ID		MW-07_20220523	MW-16_20210914	MW-16_20220111	MW-16_20220524	MW-22_20210914
Laboratory Sample ID		460-258686-4	460-242758-3	460-250593-10	460-258853-7	460-242758-2
Date Sampled		05/23/2022	9/14/2021	1/11/2022	05/24/2022	9/14/2021
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 UJ	1 U	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 UJ	10 U	10 UJ	10 UJ	10 U
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Chrysene	0.002	2 U	2 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 UJ	1 U	1 U	1 U	1 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	2.3 J	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 U	2 UJ	2 U	2 U
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Phenanthrene	50	10 J	10 U	10 U	10 U	1.7 J
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 3B
34 Berry Street
Brooklyn, New York
Remedial Action Groundwater Sampling Results
Analytical Results of Semivolatile Organic Compounds (SVOCs)

AKRF Sample ID		MW-22D_20210915	MW-22_20220111	MW-22D_20220111	MW-22_20220523	MW-22D_20220523
Laboratory Sample ID		460-242848-1	460-250593-1	460-250593-3	460-258686-1	460-258686-2
Date Sampled		9/15/2021	1/11/2022	1/11/2022	05/23/2022	05/23/2022
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Acenaphthene	20	10 U	10 U	10 U	10 U	10 U
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 UJ	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 U	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 U	10 UJ	10 UJ	10 UJ	10 UJ
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Chrysene	0.002	2 U	2 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 U	1 U	1 U	1 UJ
Fluoranthene	50	10 U	1.7 J	10 U	10 U	10 U
Fluorene	50	10 U	10 U	10 U	10 U	10 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 UJ	2 UJ	2 UJ	2 UJ
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Phenanthrene	50	10 U	10 U	10 U	10 U	10 U
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 3B
34 Berry Street
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Remedial Action Groundwater Sampling Results
Analytical Results of Semivolatile Organic Compounds (SVOCs)

AKRF Sample ID		MW-23_20210914	MW-23_20220111	MW-23_20220523	MW-24_20210914	MW-24_20220111
Laboratory Sample ID		460-242758-1	460-250593-2	460-258686-3	460-242758-6	460-250593-12
Date Sampled		9/14/2021	1/11/2022	05/23/2022	9/14/2021	1/11/2022
Unit		µg/L	µg/L	µg/L	µg/L	µg/L
Dilution Factor		1	1	1	1	1
Compound	**AWQSGV**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
Acenaphthene	20	10 U	10 U	10 U	1.5 J	2.2 J
Acenaphthylene	NS	10 U	10 U	10 U	10 U	10 U
Anthracene	50	10 U	10 U	10 U	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U	1 U	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U	1 U	1 UJ	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U	2 U	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 U	10 UJ	10 UJ	10 U	10 UJ
Benzo(k)Fluoranthene	0.002	1 U	1 U	1 U	1 U	1 U
Chrysene	0.002	2 U	2 U	2 U	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 U	1 UJ	1 U	1 U
Fluoranthene	50	10 U	10 U	10 U	10 U	10 U
Fluorene	50	10 U	10 U	10 U	4.1 J	5.4 J
Indeno(1,2,3-c,d)Pyrene	0.002	2 U	2 UJ	2 UJ	2 U	2 UJ
Naphthalene	10	2 U	2 U	2 U	2 U	2 U
Phenanthrene	50	10 U	10 U	10 U	10 U	1.4 J
Pyrene	50	10 U	10 U	10 U	10 U	10 U

Table 3B
34 Berry Street
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Remedial Action Groundwater Sampling Results
Analytical Results of Semivolatile Organic Compounds (SVOCs)

	AKRF Sample ID	FB-01_20220111	FB-01_20220523
	Laboratory Sample ID	460-250593-14	460-258686-6
	Date Sampled	1/11/2022	05/23/2022
	Unit	µg/L	µg/L
	Dilution Factor	1	1
Compound	**AWQSGV**	CONC Q	CONC Q
Acenaphthene	20	10 U	10 U
Acenaphthylene	NS	10 U	10 U
Anthracene	50	10 U	10 U
Benzo(a)Anthracene	0.002	1 U	1 U
Benzo(a)Pyrene	ND	1 U	1 U
Benzo(b)Fluoranthene	0.002	2 U	2 U
Benzo(g,h,i)Perylene	NS	10 UJ	10 UJ
Benzo(k)Fluoranthene	0.002	1 U	1 U
Chrysene	0.002	2 U	2 U
Dibenz(a,h)Anthracene	NS	1 U	1 UJ
Fluoranthene	50	10 U	10 U
Fluorene	50	10 U	10 U
Indeno(1,2,3-c,d)Pyrene	0.002	2 UJ	2 UJ
Naphthalene	10	2 U	2 U
Phenanthrene	50	10 U	10 U
Pyrene	50	10 U	10 U

Table 4
34 Berry Street
Brooklyn, New York
Baseline Sub-Slab Soil Gas Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

				AKRF Sample ID	SG-01_20181024	SG-01_20181024	SG-01_20190827	SG-01_20190827	IA-01_20181024
				Laboratory Sample ID	200-45887-1	200-45887-1	200-50299-1	200-50299-1	200-45887-2
				Date Sampled	10/24/2018 10:58:00 AM	10/24/2018 10:58:00 AM	8/27/2019 12:21:00 PM	8/27/2019 12:21:00 PM	10/24/2018 7:58:00 AM
				Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
				Dilution Factor	1	5	1	5	1
Compound	**EPA 2001 BASE 90th percentile Indoor**	**NYSDOH 2003 SV Indoor Upper Fence**	**NYSDOH 2006 SV Intrusion Matrix Value**	CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	20.6	2.5	1,000	1.1 U	NR	1.1 U	NR	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.4	NS	1.4 U	NR	1.4 U	NR	1.4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	3.5	2.5	NS	1.5 U	NR	0.33 J	NR	1.5 U
1,1,2-Trichloroethane	1.5	0.4	NS	1.1 U	NR	1.1 U	NR	1.1 U
1,1-Dichloroethane	0.7	0.4	NS	0.81 U	NR	0.81 U	NR	0.81 U
1,1-Dichloroethene	1.4	0.4	60	0.14 U	NR	0.14 U	NR	0.14 U
1,2,4-Trichlorobenzene	6.8	0.5	NS	3.7 U	NR	3.7 U	NR	3.7 U
1,2,4-Trimethylbenzene	9.5	9.8	NS	10	NR	2.6	NR	5.5
1,2-Dibromoethane (Ethylene Dibromide)	1.5	0.4	NS	1.5 U	NR	1.5 U	NR	1.5 U
1,2-Dichlorobenzene	1.2	0.5	NS	1.2 U	NR	1.2 U	NR	1.2 U
1,2-Dichloroethane	0.9	0.4	NS	1.1	NR	0.81 U	NR	0.81 U
1,2-Dichloropropane	1.6	0.4	NS	2.5	NR	0.92 U	NR	0.92 U
1,2-Dichlorotetrafluoroethane	6.8	0.4	NS	1.4 U	NR	1.4 U	NR	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	3.7	3.9	NS	5.8	NR	0.75 J	NR	1.8
1,3-Butadiene	3	NS	NS	0.44 U	NR	0.44 U	NR	0.44 U
1,3-Dichlorobenzene	2.4	0.5	NS	1.2 U	NR	1.2 U	NR	1.2 U
1,4-Dichlorobenzene	5.5	1.2	NS	1.2 U	NR	1.2 U	NR	1.2 U
2,2,4-Trimethylpentane	NS	5	NS	8.2	NR	3.2	NR	3
2-Chlorotoluene	NS	NS	NS	1 U	NR	1 U	NR	1 U
2-Hexanone	NS	NS	NS	2 U	NR	2 U	NR	2 U
4-Ethyltoluene	3.6	NS	NS	4.6	NR	0.56 J	NR	1.8
Acetone	98.9	115	NS	NR	330 D	NR	320 D	NR
Allyl Chloride (3-Chloropropene)	NS	NS	NS	1.6 U	NR	1.6 U	NR	1.6 U
Benzene	9.4	13	NS	1.3	NR	0.98	NR	2.3
Benzyl Chloride	6.8	NS	NS	1 U	NR	1 U	NR	1 U
Bromodichloromethane	NS	NS	NS	1.3 U	NR	1.3 U	NR	1.3 U
Bromoform	NS	NS	NS	2.1 U	NR	2.1 U	NR	2.1 U
Bromomethane	1.7	0.5	NS	0.78 U	NR	0.78 U	NR	0.78 U
Carbon Disulfide	4.2	NS	NS	2.2	NR	1.6 U	NR	1.6 U
Carbon Tetrachloride	1.3	1.3	60	0.44	NR	0.32	NR	0.38
Chlorobenzene	0.9	0.4	NS	0.92 U	NR	0.92 U	NR	0.92 U
Chloroethane	1.1	0.4	NS	1.3 U	NR	1.3 U	NR	1.3 U
Chloroform	1.1	1.2	NS	1.2	NR	2.1	NR	0.98 U
Chloromethane	3.7	4.2	NS	1 U	NR	0.9 J	NR	1 U
Cis-1,2-Dichloroethylene	1.9	0.4	60	0.2 U	NR	0.14 U	NR	0.2 U
Cis-1,3-Dichloropropene	2.3	0.4	NS	0.91 U	NR	0.91 U	NR	0.91 U
Cyclohexane	NS	6.3	NS	25	NR	1.4	NR	1.8
Cymene	NS	NS	NS	1.1 U	NR	1.1 U	NR	1.1 U
Dibromochloromethane	NS	NS	NS	1.7 U	NR	1.7 U	NR	1.7 U
Dichlorodifluoromethane	16.5	10	NS	2.5 U	NR	1.9 J	NR	2.5 U
Ethylbenzene	5.7	6.4	NS	NR	190 D	1.2	NR	7.5
Hexachlorobutadiene	6.8	0.5	NS	2.1 U	NR	2.1 U	NR	2.1 U
Isopropanol	250	NS	NS	12 U	NR	22	NR	24
Isopropylbenzene (Cumene)	NS	0.8	NS	0.98 U	NR	0.98 U	NR	0.98 U
M,P-Xylenes	22.2	11	NS	NR	1200 D	5	NR	30
Methyl Ethyl Ketone (2-Butanone)	12	16	NS	13	NR	12	NR	2.5
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	6	1.9	NS	2 U	NR	1.7 J	NR	2.9
Methylene Chloride	10	16	1,000	1.7 U	NR	1.7 U	NR	1.7 U
Naphthalene	5.1	NS	NS	2.6 U	NR	2.6 U	NR	2.6 U
N-Butylbenzene	NS	1.1	NS	1.1 U	NR	1.1 U	NR	1.1 U
N-Heptane	NS	18	NS	0.82 U	NR	2	NR	2.3
N-Hexane	10.2	14	NS	1.8	NR	2.2	NR	3.5
N-Propylbenzene	NS	1.5	NS	0.98 U	NR	0.41 J	NR	1.1
O-Xylene (1,2-Dimethylbenzene)	7.9	7.1	NS	NR	580 D	1.9	NR	8.4
Sec-Butylbenzene	NS	1.2	NS	1.1 U	NR	1.1 U	NR	1.1 U
Styrene	1.9	1.4	NS	0.85 U	NR	0.39 J	NR	0.85 U
T-Butylbenzene	NS	1.3	NS	1.1 U	NR	1.1 U	NR	1.1 U
Tert-Butyl Alcohol	NS	NS	NS	15 U	NR	13 J	NR	15 U
Tert-Butyl Methyl Ether	11.5	14	NS	0.72 U	NR	2.8	NR	0.72 U
Tetrachloroethylene (PCE)	15.9	2.5	1,000	4.4	NR	1.1 J	NR	2.8
Tetrahydrofuran	NS	0.8	NS	15 U	NR	15 U	NR	15 U
Toluene	43	57	NS	35	NR	6.3	NR	NR
Trans-1,2-Dichloroethene	NS	NS	NS	0.79 U	NR	0.79 U	NR	0.79 U
Trans-1,3-Dichloropropene	1.3	ND	NS	0.91 U	NR	0.91 U	NR	0.91 U
Trichloroethylene (TCE)	4.2	0.5	60	12	NR	0.19 U	NR	0.21
Trichlorofluoromethane	18.1	12	NS	1.1 U	NR	1.1	NR	1.1 U
Vinyl Bromide	NS	NS	NS	0.87 U	NR	0.87 U	NR	0.87 U
Vinyl Chloride	1.9	0.4	60	9.4	NR	0.09 U	NR	0.2 U

Table 4
34 Berry Street
Brooklyn, New York
Baseline Sub-Slab Soil Gas Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

				AKRF Sample ID	IA-01_20181024	IA-01_20190827	SG-02_20181024	SG-02_20181024	SG-02_20190827
				Laboratory Sample ID	200-45887-2	200-50299-4	200-45887-3	200-45887-3	200-50299-2
				Date Sampled	10/24/2018 7:58:00 AM	8/27/2019 12:22:00 PM	10/24/2018 7:46:00 AM	10/24/2018 7:46:00 AM	8/27/2019 12:25:00 PM
				Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
				Dilution Factor	10	1	1	3	1
Compound	**EPA 2001 BASE 90th percentile Indoor**	**NYSDOH 2003 SV Indoor Upper Fence**	**NYSDOH 2006 SV Intrusion Matrix Value**		CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	20.6	2.5	1,000		NR	1.1 U	1.1 UJ	NR	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.4	NS		NR	1.4 U	1.4 UJ	NR	1.4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	3.5	2.5	NS		NR	0.44 J	1.5 UJ	NR	0.35 J
1,1,2-Trichloroethane	1.5	0.4	NS		NR	1.1 U	1.1 UJ	NR	1.1 U
1,1-Dichloroethane	0.7	0.4	NS		NR	0.81 U	0.81 UJ	NR	0.81 U
1,1-Dichloroethene	1.4	0.4	60		NR	0.14 U	0.14 UJ	NR	0.14 U
1,2,4-Trichlorobenzene	6.8	0.5	NS		NR	3.7 U	3.7 UJ	NR	3.7 U
1,2,4-Trimethylbenzene	9.5	9.8	NS		NR	0.84 J	4 J	NR	2.4
1,2-Dibromoethane (Ethylene Dibromide)	1.5	0.4	NS		NR	1.5 U	1.5 UJ	NR	1.5 U
1,2-Dichlorobenzene	1.2	0.5	NS		NR	1.2 U	1.2 UJ	NR	1.2 U
1,2-Dichloroethane	0.9	0.4	NS		NR	0.81 U	0.81 UJ	NR	0.81 U
1,2-Dichloropropane	1.6	0.4	NS		NR	0.92 U	0.92 UJ	NR	0.92 U
1,2-Dichlorotetrafluoroethane	6.8	0.4	NS		NR	1.4 U	1.4 UJ	NR	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	3.7	3.9	NS		NR	0.98 U	2 J	NR	0.65 J
1,3-Butadiene	3	NS	NS		NR	0.44 U	0.44 UJ	NR	0.44 U
1,3-Dichlorobenzene	2.4	0.5	NS		NR	1.2 U	1.2 UJ	NR	1.2 U
1,4-Dichlorobenzene	5.5	1.2	NS		NR	1.2 U	1.2 UJ	NR	1.2 U
2,2,4-Trimethylpentane	NS	5	NS		NR	0.72 J	0.93 UJ	NR	3.6
2-Chlorotoluene	NS	NS	NS		NR	1 U	1 UJ	NR	1 U
2-Hexanone	NS	NS	NS		NR	2 U	2 UJ	NR	2 U
4-Ethyltoluene	3.6	NS	NS		NR	0.98 U	0.98 UJ	NR	0.52 J
Acetone	98.9	115	NS		580 D	25	NR	140 JD	NR
Allyl Chloride (3-Chloropropene)	NS	NS	NS		NR	1.6 U	1.6 UJ	NR	1.6 U
Benzene	9.4	13	NS		NR	0.41 J	4.1	NR	1.5
Benzyl Chloride	6.8	NS	NS		NR	1 U	1 UJ	NR	1 U
Bromodichloromethane	NS	NS	NS		NR	1.3 U	1.3 UJ	NR	1.3 U
Bromoform	NS	NS	NS		NR	2.1 U	2.1 UJ	NR	2.1 U
Bromomethane	1.7	0.5	NS		NR	0.78 U	0.78 UJ	NR	0.78 U
Carbon Disulfide	4.2	NS	NS		NR	1.6 U	2.6	NR	0.39 J
Carbon Tetrachloride	1.3	1.3	60		NR	0.33	0.77 J	NR	0.34
Chlorobenzene	0.9	0.4	NS		NR	0.92 U	0.92 UJ	NR	0.92 U
Chloroethane	1.1	0.4	NS		NR	1.3 U	1.3 UJ	NR	1.3 U
Chloroform	1.1	1.2	NS		NR	0.41 J	1.4	NR	0.56 J
Chloromethane	3.7	4.2	NS		NR	1.1	1 UJ	NR	1 U
Cis-1,2-Dichloroethylene	1.9	0.4	60		NR	0.14 U	0.2 UJ	NR	0.14 U
Cis-1,3-Dichloropropene	2.3	0.4	NS		NR	0.91 U	0.91 UJ	NR	0.91 U
Cyclohexane	NS	6.3	NS		NR	0.63 J	6 J	NR	0.77
Cymene	NS	NS	NS		NR	1.1 U	1.1 UJ	NR	1.1 U
Dibromochloromethane	NS	NS	NS		NR	1.7 U	1.7 UJ	NR	1.7 U
Dichlorodifluoromethane	16.5	10	NS		NR	1.9 J	2.5 UJ	NR	1.9 J
Ethylbenzene	5.7	6.4	NS		NR	0.79 J	3.2 J	NR	2.4
Hexachlorobutadiene	6.8	0.5	NS		NR	2.1 U	2.1 UJ	NR	2.1 U
Isopropanol	250	NS	NS		NR	12 U	12 UJ	NR	22
Isopropylbenzene (Cumene)	NS	0.8	NS		NR	0.98 U	0.98 UJ	NR	0.98 U
M,P-Xylenes	22.2	11	NS		NR	3.1	16 J	NR	9.6
Methyl Ethyl Ketone (2-Butanone)	12	16	NS		NR	0.98 J	7.8 J	NR	16
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	6	1.9	NS		NR	2 U	2 UJ	NR	2.4
Methylene Chloride	10	16	1,000		NR	1.7 U	1.7 UJ	NR	1.7 U
Naphthalene	5.1	NS	NS		NR	2.6 U	2.6 UJ	NR	2.6 U
N-Butylbenzene	NS	1.1	NS		NR	1.1 U	1.1 UJ	NR	1.1 U
N-Heptane	NS	18	NS		NR	0.7 J	5.1 J	NR	2.4
N-Hexane	10.2	14	NS		NR	0.64 J	3.9 J	NR	2.4
N-Propylbenzene	NS	1.5	NS		NR	0.98 U	0.98 UJ	NR	0.98 U
O-Xylene (1,2-Dimethylbenzene)	7.9	7.1	NS		NR	1	6.6 J	NR	2.9
Sec-Butylbenzene	NS	1.2	NS		NR	1.1 U	1.1 UJ	NR	1.1 U
Styrene	1.9	1.4	NS		NR	0.85 U	0.85 UJ	NR	0.85 U
T-Butylbenzene	NS	1.3	NS		NR	1.1 U	1.1 UJ	NR	1.1 U
Tert-Butyl Alcohol	NS	NS	NS		NR	15 U	NR	150 JD	19
Tert-Butyl Methyl Ether	11.5	14	NS		NR	0.72 U	0.72 UJ	NR	1.3
Tetrachloroethylene (PCE)	15.9	2.5	1,000		NR	0.5 J	5.3 J	NR	0.72 J
Tetrahydrofuran	NS	0.8	NS		NR	15 U	15 UJ	NR	15 U
Toluene	43	57	NS		290 D	4.9	10 J	NR	6.9
Trans-1,2-Dichloroethene	NS	NS	NS		NR	0.79 U	0.79 UJ	NR	0.79 U
Trans-1,3-Dichloropropene	1.3	ND	NS		NR	0.91 U	0.91 UJ	NR	0.91 U
Trichloroethylene (TCE)	4.2	0.5	60		NR	0.19 U	1.1 J	NR	0.19 U
Trichlorofluoromethane	18.1	12	NS		NR	1.1	1.1 UJ	NR	1.4
Vinyl Bromide	NS	NS	NS		NR	0.87 U	0.87 UJ	NR	0.87 U
Vinyl Chloride	1.9	0.4	60		NR	0.09 U	0.2 UJ	NR	0.09 U

Table 4
34 Berry Street
Brooklyn, New York
Baseline Sub-Slab Soil Gas Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

				AKRF Sample ID	SG-02_20190827	SG-X_20181024	IA-02_20181024	SG-03_20181024	SG-03_20190827
				Laboratory Sample ID	200-50299-2	200-45887-5	200-45887-4	200-45887-6	200-50299-3
				Date Sampled	8/27/2019 12:25:00 PM	10/24/2018 7:46:00 AM	10/24/2018 7:46:00 AM	10/24/2018 7:43:00 AM	8/27/2019 12:28:00 PM
				Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
				Dilution Factor	5	1	1	1	1
Compound	**EPA 2001 BASE 90th percentile Indoor**	**NYSDOH 2003 SV Indoor Upper Fence**	**NYSDOH 2006 SV Intrusion Matrix Value**		CONC Q	CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	20.6	2.5	1,000		NR	1.1 U	1.1 U	1.1 U	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.4	NS		NR	1.4 U	1.4 U	1.4 U	1.4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	3.5	2.5	NS		NR	1.5 U	1.5 U	1.5 U	0.39 J
1,1,2-Trichloroethane	1.5	0.4	NS		NR	1.1 U	1.1 U	1.1 U	1.1 U
1,1-Dichloroethane	0.7	0.4	NS		NR	0.81 U	0.81 U	0.81 U	0.81 U
1,1-Dichloroethene	1.4	0.4	60		NR	0.14 U	0.14 U	0.14 U	0.14 U
1,2,4-Trichlorobenzene	6.8	0.5	NS		NR	3.7 U	3.7 U	3.7 U	3.7 U
1,2,4-Trimethylbenzene	9.5	9.8	NS		NR	2 JL	2	1.8	2.6
1,2-Dibromoethane (Ethylene Dibromide)	1.5	0.4	NS		NR	1.5 U	1.5 U	1.5 U	1.5 U
1,2-Dichlorobenzene	1.2	0.5	NS		NR	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	0.9	0.4	NS		NR	0.81 U	0.81 U	1.2	0.81 U
1,2-Dichloropropane	1.6	0.4	NS		NR	0.92 U	0.92 U	0.92 U	0.92 U
1,2-Dichlorotetrafluoroethane	6.8	0.4	NS		NR	1.4 U	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	3.7	3.9	NS		NR	0.99 JL	0.98 U	0.98 U	0.63 J
1,3-Butadiene	3	NS	NS		NR	0.44 U	0.44 U	0.52	0.35 J
1,3-Dichlorobenzene	2.4	0.5	NS		NR	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	5.5	1.2	NS		NR	1.2 U	1.2 U	1.2 U	1.2 U
2,2,4-Trimethylpentane	NS	5	NS		NR	4.9	4.7	3.6	3.3
2-Chlorotoluene	NS	NS	NS		NR	1 U	1 U	1 U	1 U
2-Hexanone	NS	NS	NS		NR	2 U	2 U	2 U	2 U
4-Ethyltoluene	3.6	NS	NS		NR	0.98 U	0.98 U	0.98 U	0.56 J
Acetone	98.9	115	NS		380 D	89	26	67	NR
Allyl Chloride (3-Chloropropene)	NS	NS	NS		NR	1.6 U	1.6 U	1.6 U	1.6 U
Benzene	9.4	13	NS		NR	4.5	3	3.1	2.2
Benzyl Chloride	6.8	NS	NS		NR	1 U	1 U	1 U	1 U
Bromodichloromethane	NS	NS	NS		NR	1.3 U	1.3 U	1.3 U	1.3 U
Bromoform	NS	NS	NS		NR	2.1 U	2.1 U	2.1 U	2.1 U
Bromomethane	1.7	0.5	NS		NR	0.78 U	0.78 U	0.78 U	0.78 U
Carbon Disulfide	4.2	NS	NS		NR	1.6 U	1.6 U	5.3	11
Carbon Tetrachloride	1.3	1.3	60		NR	0.39	0.22	0.39	0.31
Chlorobenzene	0.9	0.4	NS		NR	0.92 U	0.92 U	0.92 U	0.92 U
Chloroethane	1.1	0.4	NS		NR	1.3 U	1.3 U	1.3 U	1.3 U
Chloroform	1.1	1.2	NS		NR	0.98 U	0.98 U	1.4	1.1
Chloromethane	3.7	4.2	NS		NR	1 U	1 U	1.8	0.53 J
Cis-1,2-Dichloroethylene	1.9	0.4	60		NR	0.2 U	0.2 U	0.2 U	0.14 U
Cis-1,3-Dichloropropene	2.3	0.4	NS		NR	0.91 U	0.91 U	0.91 U	0.91 U
Cyclohexane	NS	6.3	NS		NR	2.7	1.5	2.3	0.83
Cymene	NS	NS	NS		NR	1.1 U	1.1 U	1.1 U	0.41 J
Dibromochloromethane	NS	NS	NS		NR	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	16.5	10	NS		NR	2.5 U	2.5 U	2.5 U	2 J
Ethylbenzene	5.7	6.4	NS		NR	1.9 JL	1.9	1.8	2.5
Hexachlorobutadiene	6.8	0.5	NS		NR	2.1 U	2.1 U	2.1 U	2.1 U
Isopropanol	250	NS	NS		NR	12 U	12 U	12 U	15
Isopropylbenzene (Cumene)	NS	0.8	NS		NR	0.98 U	0.98 U	0.98 U	0.98 U
M,P-Xylenes	22.2	11	NS		NR	6.2 JL	6.1	6	9.9
Methyl Ethyl Ketone (2-Butanone)	12	16	NS		NR	3.7	4.1	4.5	16
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	6	1.9	NS		NR	2 U	2 U	2 U	2.6
Methylene Chloride	10	16	1,000		NR	1.7 U	1.7 U	1.7 U	1.7 U
Naphthalene	5.1	NS	NS		NR	2.6 U	2.6 U	16	2.6 U
N-Butylbenzene	NS	1.1	NS		NR	1.1 U	1.1 U	1.1 U	1.1 U
N-Heptane	NS	18	NS		NR	2.5 JL	2.7	1.8	2.4
N-Hexane	10.2	14	NS		NR	4.1	4.7	3.2	2.8
N-Propylbenzene	NS	1.5	NS		NR	0.98 U	0.98 U	0.98 U	0.98 U
O-Xylene (1,2-Dimethylbenzene)	7.9	7.1	NS		NR	2.6 JL	2.3	2.4	3.2
Sec-Butylbenzene	NS	1.2	NS		NR	1.1 U	1.1 U	1.1 U	1.1 U
Styrene	1.9	1.4	NS		NR	0.85 U	0.85 U	0.85 U	0.85 U
T-Butylbenzene	NS	1.3	NS		NR	1.1 U	1.1 U	1.1 U	1.1 U
Tert-Butyl Alcohol	NS	NS	NS		NR	57	15 U	16	15 U
Tert-Butyl Methyl Ether	11.5	14	NS		NR	0.72 U	0.72 U	0.72 U	0.64 J
Tetrachloroethylene (PCE)	15.9	2.5	1,000		NR	1.8 JL	1.4 U	1.9	0.76 J
Tetrahydrofuran	NS	0.8	NS		NR	15 U	15 U	15 U	15 U
Toluene	43	57	NS		NR	18	16	9.1	7.5
Trans-1,2-Dichloroethene	NS	NS	NS		NR	0.79 U	0.79 U	0.79 U	0.45 J
Trans-1,3-Dichloropropene	1.3	ND	NS		NR	0.91 U	0.91 U	0.91 U	0.91 U
Trichloroethylene (TCE)	4.2	0.5	60		NR	0.28 JL	0.19 U	0.78	0.19 U
Trichlorofluoromethane	18.1	12	NS		NR	1.1 U	1.1 U	1.1 U	1.2
Vinyl Bromide	NS	NS	NS		NR	0.87 U	0.87 U	0.87 U	0.87 U
Vinyl Chloride	1.9	0.4	60		NR	0.2 U	0.2 U	0.2 U	0.09 U

Table 4
34 Berry Street
Brooklyn, New York
Baseline Sub-Slab Soil Gas Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

				AKRF Sample ID	SG-03_20190827	IA-03_20181024	AA-01_20181024	AA-01_20190827
				Laboratory Sample ID	200-50299-3	200-45887-7	200-45887-8	200-50299-5
				Date Sampled	8/27/2019 12:28:00 PM	10/24/2018 7:44:00 AM	10/24/2018 7:52:00 AM	8/27/2019 12:10:00 PM
				Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3
				Dilution Factor	5	1	1	1
Compound	**EPA 2001 BASE 90th percentile Indoor**	**NYSDOH 2003 SV Indoor Upper Fence**	**NYSDOH 2006 SV Intrusion Matrix Value**		CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	20.6	2.5	1,000		NR	1.1 U	1.1 U	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.4	NS		NR	1.4 U	1.4 U	1.4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane	3.5	2.5	NS		NR	1.5 U	1.5 U	0.34 J
1,1,2-Trichloroethane	1.5	0.4	NS		NR	1.1 U	1.1 U	1.1 U
1,1-Dichloroethane	0.7	0.4	NS		NR	0.81 U	0.81 U	0.81 U
1,1-Dichloroethene	1.4	0.4	60		NR	0.14 U	0.14 U	0.14 U
1,2,4-Trichlorobenzene	6.8	0.5	NS		NR	3.7 U	3.7 U	3.7 U
1,2,4-Trimethylbenzene	9.5	9.8	NS		NR	1.5	0.98 U	0.44 J
1,2-Dibromoethane (Ethylene Dibromide)	1.5	0.4	NS		NR	1.5 U	1.5 U	1.5 U
1,2-Dichlorobenzene	1.2	0.5	NS		NR	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	0.9	0.4	NS		NR	0.81 U	0.81 U	0.81 U
1,2-Dichloropropane	1.6	0.4	NS		NR	0.92 U	0.92 U	0.92 U
1,2-Dichlorotetrafluoroethane	6.8	0.4	NS		NR	1.4 U	1.4 U	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	3.7	3.9	NS		NR	0.98 U	0.98 U	0.98 U
1,3-Butadiene	3	NS	NS		NR	0.44 U	0.44 U	0.44 U
1,3-Dichlorobenzene	2.4	0.5	NS		NR	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	5.5	1.2	NS		NR	1.2 U	1.2 U	1.2 U
2,2,4-Trimethylpentane	NS	5	NS		NR	4.6	0.93 U	0.75 J
2-Chlorotoluene	NS	NS	NS		NR	1 U	1 U	1 U
2-Hexanone	NS	NS	NS		NR	2 U	2 U	2 U
4-Ethyltoluene	3.6	NS	NS		NR	0.98 U	0.98 U	0.98 U
Acetone	98.9	115	NS		360 D	17	12 U	9.1 J
Allyl Chloride (3-Chloropropene)	NS	NS	NS		NR	1.6 U	1.6 U	1.6 U
Benzene	9.4	13	NS		NR	3	0.79	0.45 J
Benzyl Chloride	6.8	NS	NS		NR	1 U	1 U	1 U
Bromodichloromethane	NS	NS	NS		NR	1.3 U	1.3 U	1.3 U
Bromoform	NS	NS	NS		NR	2.1 U	2.1 U	2.1 U
Bromomethane	1.7	0.5	NS		NR	0.78 U	0.78 U	0.78 U
Carbon Disulfide	4.2	NS	NS		NR	1.6 U	1.6 U	1.1 J
Carbon Tetrachloride	1.3	1.3	60		NR	0.41	0.36	0.37
Chlorobenzene	0.9	0.4	NS		NR	0.92 U	0.92 U	0.92 U
Chloroethane	1.1	0.4	NS		NR	1.3 U	1.3 U	1.3 U
Chloroform	1.1	1.2	NS		NR	0.98 U	0.98 U	0.98 U
Chloromethane	3.7	4.2	NS		NR	1 U	1 U	1
Cis-1,2-Dichloroethylene	1.9	0.4	60		NR	0.2 U	0.2 U	0.14 U
Cis-1,3-Dichloropropene	2.3	0.4	NS		NR	0.91 U	0.91 U	0.91 U
Cyclohexane	NS	6.3	NS		NR	1.5	0.69 U	0.69 U
Cymene	NS	NS	NS		NR	1.1 U	1.1 U	1.1 U
Dibromochloromethane	NS	NS	NS		NR	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	16.5	10	NS		NR	2.5 U	2.5 U	2.1 J
Ethylbenzene	5.7	6.4	NS		NR	1.7	0.87 U	0.87 U
Hexachlorobutadiene	6.8	0.5	NS		NR	2.1 U	2.1 U	2.1 U
Isopropanol	250	NS	NS		NR	12 U	12 U	12 U
Isopropylbenzene (Cumene)	NS	0.8	NS		NR	0.98 U	0.98 U	0.98 U
M,P-Xylenes	22.2	11	NS		NR	5.7	2.2 U	0.94 J
Methyl Ethyl Ketone (2-Butanone)	12	16	NS		NR	1.5 U	1.5 U	1.2 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	6	1.9	NS		NR	2 U	2 U	2 U
Methylene Chloride	10	16	1,000		NR	1.7 U	1.7 U	0.72 J
Naphthalene	5.1	NS	NS		NR	2.6 U	2.6 U	2.6 U
N-Butylbenzene	NS	1.1	NS		NR	1.1 U	1.1 U	1.1 U
N-Heptane	NS	18	NS		NR	2.2	0.82 U	0.82 U
N-Hexane	10.2	14	NS		NR	4.7	0.84	0.68 J
N-Propylbenzene	NS	1.5	NS		NR	0.98 U	0.98 U	0.98 U
O-Xylene (1,2-Dimethylbenzene)	7.9	7.1	NS		NR	1.9	0.87 U	0.87 U
Sec-Butylbenzene	NS	1.2	NS		NR	1.1 U	1.1 U	1.1 U
Styrene	1.9	1.4	NS		NR	0.85 U	0.85 U	0.85 U
T-Butylbenzene	NS	1.3	NS		NR	1.1 U	1.1 U	1.1 U
Tert-Butyl Alcohol	NS	NS	NS		NR	15 U	15 U	15 U
Tert-Butyl Methyl Ether	11.5	14	NS		NR	0.72 U	0.72 U	0.72 U
Tetrachloroethylene (PCE)	15.9	2.5	1,000		NR	1.4 U	1.4 U	0.32 J
Tetrahydrofuran	NS	0.8	NS		NR	15 U	15 U	15 U
Toluene	43	57	NS		NR	12	1	2
Trans-1,2-Dichloroethene	NS	NS	NS		NR	0.79 U	0.79 U	0.79 U
Trans-1,3-Dichloropropene	1.3	ND	NS		NR	0.91 U	0.91 U	0.91 U
Trichloroethylene (TCE)	4.2	0.5	60		NR	0.19 U	0.19 U	0.19 U
Trichlorofluoromethane	18.1	12	NS		NR	1.1 U	1.1 U	1.1
Vinyl Bromide	NS	NS	NS		NR	0.87 U	0.87 U	0.87 U
Vinyl Chloride	1.9	0.4	60		NR	0.2 U	0.2 U	0.09 U

Table 5
34 Berry Street
Brooklyn, New York
Remedial Action Sub-Slab Soil Gas Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

				AKRF Sample ID	SG-01_20210917	SG-01_20220524	SG-02_20210917	SG-0X_20210917
				Laboratory Sample ID	200-60168-2	200-63573-1	200-60168-3	200-60168-4
				Date Sampled	9/17/2021	5/24/2022	9/17/2021	9/17/2021
				Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3
				Dilution Factor	10	1	10	1
Compound	**EPA 2001 BASE 90th percentile Indoor**	**NYSDOH 2003 SV Indoor Upper Fence**	**NYSDOH 2006 SV Intrusion Matrix Value**		CONC Q	CONC Q	CONC Q	CONC Q
1,1,1-Trichloroethane	20.6	2.5	1,000		11 UJ	1.1 U	11 UJ	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.4	NS		14 UJ	1.4 U	14 UJ	1.4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	3.5	2.5	NS		15 UJ	0.44 J	15 UJ	1.5 U
1,1,2-Trichloroethane	1.5	0.4	NS		11 UJ	1.1 U	11 UJ	1.1 U
1,1-Dichloroethane	0.7	0.4	NS		8.1 UJ	0.81 U	8.1 UJ	0.81 U
1,1-Dichloroethene	1.4	0.4	60		1.4 UJ	0.14 U	1.4 UJ	0.14 U
1,2,4-Trichlorobenzene	6.8	0.5	NS		37 UJ	3.7 UJ	37 UJ	3.7 U
1,2,4-Trimethylbenzene	9.5	9.8	NS		9.8 UJ	0.27 J	9.8 UJ	1
1,2-Dibromoethane (Ethylene Dibromide)	1.5	0.4	NS		15 UJ	1.5 U	15 UJ	1.5 U
1,2-Dichlorobenzene	1.2	0.5	NS		12 UJ	1.2 U	12 UJ	1.2 U
1,2-Dichloroethane	0.9	0.4	NS		8.1 UJ	1.3	8.1 UJ	0.81 U
1,2-Dichloropropane	1.6	0.4	NS		9.2 UJ	0.92 U	9.2 UJ	0.92 U
1,2-Dichlorotetrafluoroethane	6.8	0.4	NS		14 UJ	1.4 U	14 UJ	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	3.7	3.9	NS		9.8 UJ	0.98 U	9.8 UJ	0.98 U
1,3-Butadiene	3	NS	NS		4.4 UJ	0.44 U	4.4 UJ	0.44 U
1,3-Dichlorobenzene	2.4	0.5	NS		12 UJ	1.2 U	12 UJ	1.2 U
1,4-Dichlorobenzene	5.5	1.2	NS		12 UJ	1.2 U	12 UJ	1.2 U
2,2,4-Trimethylpentane	NS	5	NS		9.3 UJ	0.32 J	9.3 UJ	0.93 U
2-Chlorotoluene	NS	NS	NS		10 UJ	1 U	10 UJ	1 U
2-Hexanone	NS	NS	NS		20 UJ	2 U	20 UJ	2 U
4-Ethyltoluene	3.6	NS	NS		9.8 UJ	0.98 U	9.8 UJ	0.98 U
Acetone	98.9	115	NS		120 UJ	5.3 J	120 UJ	24
Allyl Chloride (3-Chloropropene)	NS	NS	NS		16 UJ	1.6 U	16 UJ	1.6 U
Benzene	9.4	13	NS		6.4 UJ	0.39 J	6.4 UJ	0.27 J
Benzyl Chloride	6.8	NS	NS		10 UJ	1 U	10 UJ	1 U
Bromodichloromethane	NS	NS	NS		13 UJ	0.79 J	13 UJ	1.3 U
Bromoform	NS	NS	NS		21 UJ	2.1 U	21 UJ	2.1 U
Bromomethane	1.7	0.5	NS		7.8 UJ	0.78 U	7.8 UJ	0.78 U
Butane	NS	NS	NS		46 J	30	12 UJ	1.2 U
Carbon Disulfide	4.2	NS	NS		16 UJ	0.96 J	6.3 J	1.6 U
Carbon Tetrachloride	1.3	1.3	60		2.2 UJ	0.33	2.2 UJ	0.31
Chlorobenzene	0.9	0.4	NS		9.2 UJ	0.92 U	9.2 UJ	0.92 U
Chlorodifluoromethane	NS	NS	NS		18 UJ	1.6 J	18 UJ	0.6 J
Chloroethane	1.1	0.4	NS		13 UJ	1.3 U	13 UJ	1.3 U
Chloroform	1.1	1.2	NS		9.8 UJ	12	9.8 UJ	0.99
Chloromethane	3.7	4.2	NS		10 UJ	0.53 J	10 UJ	1 U
Cis-1,2-Dichloroethylene	1.9	0.4	60		1.4 UJ	0.14 U	1.4 UJ	0.14 U
Cis-1,3-Dichloropropene	2.3	0.4	NS		9.1 UJ	0.91 U	9.1 UJ	0.91 U
Cyclohexane	NS	6.3	NS		6.9 UJ	0.58 J	6.9 UJ	0.69 U
Cymene	NS	NS	NS		11 UJ	1.1 U	11 UJ	2
Dibromochloromethane	NS	NS	NS		17 UJ	1.7 U	17 UJ	1.7 U
Dichlorodifluoromethane	16.5	10	NS		25 UJ	2.2 J	25 UJ	1.3 J
Ethylbenzene	5.7	6.4	NS		8.7 UJ	0.46 J	8.7 UJ	0.8 J
Hexachlorobutadiene	6.8	0.5	NS		21 UJ	2.1 U	21 UJ	2.1 U
Isopropanol	250	NS	NS		120 UJ	12 U	120 UJ	48
Isopropylbenzene (Cumene)	NS	0.8	NS		9.8 UJ	0.98 U	9.8 UJ	0.98 U
M,P-Xylenes	22.2	11	NS		22 UJ	1.8 J	22 UJ	2.5
Methyl Ethyl Ketone (2-Butanone)	12	16	NS		15 UJ	0.52 J	15 UJ	5.4
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	6	1.9	NS		20 UJ	2 U	20 UJ	2 U
Methyl Methacrylate	NS	0.4	NS		20 UJ	2 U	20 UJ	2 U
Methylene Chloride	10	16	1,000		17 UJ	2.2	17 UJ	1.7 U
Naphthalene	5.1	NS	NS		26 UJ	2.6 UJ	26 UJ	2.6 U
N-Butylbenzene	NS	1.1	NS		11 UJ	1.1 U	11 UJ	1.1 U
N-Heptane	NS	18	NS		8.2 UJ	0.28 J	8.2 UJ	0.82 U
N-Hexane	10.2	14	NS		18 UJ	1.3 J	18 UJ	1.8 U
N-Propylbenzene	NS	1.5	NS		9.8 UJ	0.98 U	9.8 UJ	0.98 U
O-Xylene (1,2-Dimethylbenzene)	7.9	7.1	NS		8.7 UJ	0.54 J	8.7 UJ	1.5
Sec-Butylbenzene	NS	1.2	NS		11 UJ	1.1 U	11 UJ	1.1 U
Styrene	1.9	1.4	NS		8.5 UJ	0.85 U	8.5 UJ	0.85 U
T-Butylbenzene	NS	1.3	NS		11 UJ	1.1 U	11 UJ	1.1 U
Tert-Butyl Alcohol	NS	NS	NS		150 UJ	15 U	150 UJ	15 U
Tert-Butyl Methyl Ether	11.5	14	NS		7.2 UJ	0.72 U	7.2 UJ	0.72 U
Tetrachloroethylene (PCE)	15.9	2.5	1,000		14 UJ	1.9	4.2 J	4.4
Tetrahydrofuran	NS	0.8	NS		150 UJ	15 U	150 UJ	4.9 J
Toluene	43	57	NS		7.5 UJ	2.5	7.5 UJ	1.8
Trans-1,2-Dichloroethene	NS	NS	NS		7.9 UJ	0.79 U	7.9 UJ	0.79 U
Trans-1,3-Dichloropropene	1.3	ND	NS		9.1 UJ	0.91 U	9.1 UJ	0.91 U
Trichloroethylene (TCE)	4.2	0.5	60		8.4 J	2.7	1.9 UJ	0.67
Trichlorofluoromethane	18.1	12	NS		11 UJ	1.1	11 UJ	0.96 J
Vinyl Bromide	NS	NS	NS		8.7 UJ	0.87 U	8.7 UJ	0.87 U
Vinyl Chloride	1.9	0.4	60		0.9 UJ	0.09 U	0.9 UJ	0.09 U

Table 5
34 Berry Street
Brooklyn, New York
Remedial Action Sub-Slab Soil Gas Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

				AKRF Sample ID	SG-02_20220524	SG-03_20210917	SG-03_20220525	SG-03_20220525	SG-0X_20220525
				Laboratory Sample ID	200-63573-2	200-60168-5	200-63573-5	200-63573-5	200-63573-4
				Date Sampled	5/24/2022	9/17/2021	5/25/2022	5/25/2022	5/25/2022
				Unit	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3
				Dilution Factor	1	1	1	10	1
Compound	**EPA 2001 BASE 90th percentile Indoor**	**NYSDOH 2003 SV Indoor Upper Fence**	**NYSDOH 2006 SV Intrusion Matrix Value**		Conc Q	CONC Q	Conc Q	Conc Q	Conc Q
1,1,1-Trichloroethane	20.6	2.5	1,000		1.1 U	1.1 U	1.1 U	NR	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.4	NS		1.4 U	1.4 U	1.4 U	NR	1.4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	3.5	2.5	NS		0.42 J	1.5 U	0.42 J	NR	1.5 U
1,1,2-Trichloroethane	1.5	0.4	NS		1.1 U	1.1 U	1.1 U	NR	1.1 U
1,1-Dichloroethane	0.7	0.4	NS		0.81 U	0.81 U	0.81 U	NR	0.81 U
1,1-Dichloroethene	1.4	0.4	60		0.14 U	0.14 U	0.14 U	NR	0.14 U
1,2,4-Trichlorobenzene	6.8	0.5	NS		3.7 UJ	3.7 U	3.7 UJ	NR	3.7 UJ
1,2,4-Trimethylbenzene	9.5	9.8	NS		2.2	1.7	4.3	NR	2.7
1,2-Dibromoethane (Ethylene Dibromide)	1.5	0.4	NS		1.5 U	1.5 U	1.5 U	NR	1.5 U
1,2-Dichlorobenzene	1.2	0.5	NS		1.2 U	1.2 U	1.2 U	NR	1.2 U
1,2-Dichloroethane	0.9	0.4	NS		0.81 U	0.81 U	2	NR	2
1,2-Dichloropropane	1.6	0.4	NS		0.92 U	0.92 U	0.92 U	NR	0.92 U
1,2-Dichlorotetrafluoroethane	6.8	0.4	NS		1.4 U	1.4 U	1.4 U	NR	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	3.7	3.9	NS		0.57 J	0.31 J	1.1	NR	0.69 J
1,3-Butadiene	3	NS	NS		0.24 J	0.44 U	0.44 U	NR	0.44 U
1,3-Dichlorobenzene	2.4	0.5	NS		1.2 U	1.2 U	1.2 U	NR	1.2 U
1,4-Dichlorobenzene	5.5	1.2	NS		1.2 U	1.2 U	1.2 U	NR	1.2 U
2,2,4-Trimethylpentane	NS	5	NS		0.63 J	0.93 U	3	NR	2.7
2-Chlorotoluene	NS	NS	NS		1 U	1 U	1 U	NR	1 U
2-Hexanone	NS	NS	NS		2 U	2 U	2 U	NR	2 U
4-Ethyltoluene	3.6	NS	NS		0.67 J	0.29 J	1.1	NR	0.69 J
Acetone	98.9	115	NS		14	5.1 J	35	NR	31
Allyl Chloride (3-Chloropropene)	NS	NS	NS		1.6 U	1.6 U	1.6 U	NR	1.6 U
Benzene	9.4	13	NS		1.1	0.64 U	1.9	NR	1.9
Benzyl Chloride	6.8	NS	NS		1 U	1 U	1 U	NR	1 U
Bromodichloromethane	NS	NS	NS		1.3 U	1.3 U	1.3 U	NR	1.3 U
Bromoform	NS	NS	NS		2.1 U	2.1 U	2.1 U	NR	2.1 U
Bromomethane	1.7	0.5	NS		0.4 J	0.78 U	0.78 U	NR	0.78 U
Butane	NS	NS	NS		3.3	1.2 U	4	NR	3.9
Carbon Disulfide	4.2	NS	NS		0.93 J	0.85 J	0.72 J	NR	0.4 J
Carbon Tetrachloride	1.3	1.3	60		0.34	0.27	0.33	NR	0.31
Chlorobenzene	0.9	0.4	NS		0.92 U	0.92 U	0.92 U	NR	0.92 U
Chlorodifluoromethane	NS	NS	NS		1.1 J	0.6 J	1.2 J	NR	1.2 J
Chloroethane	1.1	0.4	NS		1.3 U	1.3 U	1.3 U	NR	1.3 U
Chloroform	1.1	1.2	NS		0.39 J	0.95 J	0.32 J	NR	0.28 J
Chloromethane	3.7	4.2	NS		1.8	0.25 J	0.47 J	NR	0.4 J
Cis-1,2-Dichloroethylene	1.9	0.4	60		0.14 U	0.14 U	0.14 U	NR	0.14 U
Cis-1,3-Dichloropropene	2.3	0.4	NS		0.91 U	0.91 U	0.91 U	NR	0.91 U
Cyclohexane	NS	6.3	NS		0.26 J	0.69 U	0.63 J	NR	0.67 J
Cymene	NS	NS	NS		0.21 J	0.65 J	2.5 J	NR	0.94 J
Dibromochloromethane	NS	NS	NS		1.7 U	1.7 U	1.7 U	NR	1.7 U
Dichlorodifluoromethane	16.5	10	NS		2 J	1.2 J	1.9 J	NR	1.9 J
Ethylbenzene	5.7	6.4	NS		1.7	0.49 J	2.5	NR	1.9
Hexachlorobutadiene	6.8	0.5	NS		2.1 U	2.1 U	2.1 U	NR	2.1 U
Isopropanol	250	NS	NS		12 U	6 J	NR	470 D	NR
Isopropylbenzene (Cumene)	NS	0.8	NS		0.98 U	0.98 U	0.98 U	NR	0.98 U
M,P-Xylenes	22.2	11	NS		7.5	2.1 J	9.3	NR	6.8
Methyl Ethyl Ketone (2-Butanone)	12	16	NS		2.2	2.6	37	NR	41
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	6	1.9	NS		2 U	2 U	2.2	NR	2
Methyl Methacrylate	NS	0.4	NS		2 U	2 U	2 U	NR	2 U
Methylene Chloride	10	16	1,000		0.59 J	1.7 U	0.78 J	NR	0.85 J
Naphthalene	5.1	NS	NS		2.6 UJ	2.6 U	2.6 UJ	NR	2.6 UJ
N-Butylbenzene	NS	1.1	NS		1.1 U	0.3 J	1.1 U	NR	1.1 U
N-Heptane	NS	18	NS		0.6 J	0.82 U	1.8	NR	1.4
N-Hexane	10.2	14	NS		1.8 U	1.8 U	1.6 J	NR	1.6 J
N-Propylbenzene	NS	1.5	NS		0.36 J	0.98 U	0.75 J	NR	0.47 J
O-Xylene (1,2-Dimethylbenzene)	7.9	7.1	NS		2.3	0.91	3.7	NR	2.6
Sec-Butylbenzene	NS	1.2	NS		1.1 U	1.1 U	1.1 U	NR	1.1 U
Styrene	1.9	1.4	NS		0.37 J	0.85 U	0.87	NR	0.71 J
T-Butylbenzene	NS	1.3	NS		1.1 U	1.1 U	1.1 U	NR	1.1 U
Tert-Butyl Alcohol	NS	NS	NS		15 U	15 U	15 U	NR	15 U
Tert-Butyl Methyl Ether	11.5	14	NS		0.72 U	0.72 U	0.72 U	NR	0.72 U
Tetrachloroethylene (PCE)	15.9	2.5	1,000		0.8 J	7.3	0.24 J	NR	0.23 J
Tetrahydrofuran	NS	0.8	NS		15 U	15 U	70	NR	95
Toluene	43	57	NS		6.9	2.1	11	NR	9.4
Trans-1,2-Dichloroethene	NS	NS	NS		0.79 U	0.79 U	0.79 U	NR	0.79 U
Trans-1,3-Dichloropropene	1.3	ND	NS		0.91 U	0.91 U	0.91 U	NR	0.91 U
Trichloroethylene (TCE)	4.2	0.5	60		0.34	1.5	0.26	NR	0.22
Trichlorofluoromethane	18.1	12	NS		1.1	0.79 J	1.1	NR	1.1
Vinyl Bromide	NS	NS	NS		0.87 U	0.87 U	0.87 U	NR	0.87 U
Vinyl Chloride	1.9	0.4	60		0.09 U	0.09 U	0.09 U	NR	0.09 U

Table 5
34 Berry Street
Brooklyn, New York
Remedial Action Sub-Slab Soil Gas Sampling Results
Analytical Results of Volatile Organic Compounds (VOCs)

			AKRF Sample ID	SG-0X_20220525	SG-04_20210917	SG-04_20220524	AA-01_20210917	SG-AA_20220525
			Laboratory Sample ID	200-63573-4	200-60168-6	200-63573-3	200-60168-1	200-63573-6
			Date Sampled	5/25/2022	9/17/2021	5/24/2022 4:35:00 PM	9/17/2021	5/25/2022
			Unit	µg/m^3	µg/m^3	ug/m3	µg/m^3	µg/m^3
			Dilution Factor	10	1	1	1	1
Compound	**EPA 2001 BASE 90th percentile Indoor**	**NYSDOH 2003 SV Indoor Upper Fence**	**NYSDOH 2006 SV Intrusion Matrix Value**	Conc Q	CONC Q	Conc Q	CONC Q	Conc Q
1,1,1-Trichloroethane	20.6	2.5	1,000	NR	0.63 J	1.1 U	1.1 UJ	1.1 U
1,1,2,2-Tetrachloroethane	NS	0.4	NS	NR	1.4 U	1.4 U	1.4 UJ	1.4 U
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	3.5	2.5	NS	NR	1.5 U	1.5 U	0.44 J	0.52 J
1,1,2-Trichloroethane	1.5	0.4	NS	NR	1.1 U	1.1 U	1.1 UJ	1.1 U
1,1-Dichloroethane	0.7	0.4	NS	NR	0.81 U	0.81 U	0.81 UJ	0.81 U
1,1-Dichloroethene	1.4	0.4	60	NR	0.14 U	0.14 U	0.14 UJ	0.14 U
1,2,4-Trichlorobenzene	6.8	0.5	NS	NR	3.7 U	3.7 UJ	3.7 UJ	3.7 UJ
1,2,4-Trimethylbenzene	9.5	9.8	NS	NR	1.1	0.75 J	0.23 J	0.88 J
1,2-Dibromoethane (Ethylene Dibromide)	1.5	0.4	NS	NR	1.5 U	1.5 U	1.5 UJ	1.5 U
1,2-Dichlorobenzene	1.2	0.5	NS	NR	1.2 U	1.2 U	1.2 UJ	1.2 U
1,2-Dichloroethane	0.9	0.4	NS	NR	0.81 U	0.81 U	0.81 UJ	0.81 U
1,2-Dichloropropane	1.6	0.4	NS	NR	0.92 U	0.92 U	0.92 UJ	0.92 U
1,2-Dichlorotetrafluoroethane	6.8	0.4	NS	NR	1.4 U	1.4 U	1.4 UJ	1.4 U
1,3,5-Trimethylbenzene (Mesitylene)	3.7	3.9	NS	NR	0.33 J	0.98 U	0.98 UJ	0.3 J
1,3-Butadiene	3	NS	NS	NR	0.44 U	0.44 U	0.44 UJ	0.12 J
1,3-Dichlorobenzene	2.4	0.5	NS	NR	1.2 U	1.2 U	1.2 UJ	1.2 U
1,4-Dichlorobenzene	5.5	1.2	NS	NR	1.2 U	1.2 U	1.2 UJ	1.2 U
2,2,4-Trimethylpentane	NS	5	NS	NR	0.93 U	0.45 J	0.41 J	2.3
2-Chlorotoluene	NS	NS	NS	NR	1 U	1 U	1 UJ	1 U
2-Hexanone	NS	NS	NS	NR	1.9 J	2 U	2 UJ	2 U
4-Ethyltoluene	3.6	NS	NS	NR	0.98 U	0.98 U	0.98 UJ	0.32 J
Acetone	98.9	115	NS	NR	25	10 J	5.9 J	9.1 J
Allyl Chloride (3-Chloropropene)	NS	NS	NS	NR	1.6 U	1.6 U	1.6 UJ	1.6 U
Benzene	9.4	13	NS	NR	0.48 J	0.63 J	0.36 J	2.1
Benzyl Chloride	6.8	NS	NS	NR	1 U	1 U	1 UJ	1 U
Bromodichloromethane	NS	NS	NS	NR	1.3 U	1.3 U	1.3 UJ	1.3 U
Bromoform	NS	NS	NS	NR	2.1 U	2.1 U	2.1 UJ	2.1 U
Bromomethane	1.7	0.5	NS	NR	0.78 U	0.78 U	0.78 UJ	0.78 U
Butane	NS	NS	NS	NR	1.7	2	1.6 J	
Carbon Disulfide	4.2	NS	NS	NR	4	1.8	1.6 UJ	0.6 J
Carbon Tetrachloride	1.3	1.3	60	NR	0.22 U	0.22 U	0.28 J	0.37
Chlorobenzene	0.9	0.4	NS	NR	0.92 U	0.92 U	0.92 UJ	0.92 U
Chlorodifluoromethane	NS	NS	NS	NR	1.1 J	1.5 J	1.4 J	1.2 J
Chloroethane	1.1	0.4	NS	NR	1.3 U	1.3 U	1.3 UJ	1.3 U
Chloroform	1.1	1.2	NS	NR	31	2.9	0.98 UJ	0.98 U
Chloromethane	3.7	4.2	NS	NR	1 U	1 U	0.78 J	3
Cis-1,2-Dichloroethylene	1.9	0.4	60	NR	0.14 U	0.14 U	0.14 UJ	0.14 U
Cis-1,3-Dichloropropene	2.3	0.4	NS	NR	0.91 U	0.91 U	0.91 UJ	0.91 U
Cyclohexane	NS	6.3	NS	NR	0.69 U	0.37 J	0.69 UJ	0.6 J
Cymene	NS	NS	NS	NR	0.88 J	1.1 U	1.1 UJ	0.58 J
Dibromochloromethane	NS	NS	NS	NR	1.7 U	1.7 U	1.7 UJ	1.7 U
Dichlorodifluoromethane	16.5	10	NS	NR	2.3 J	2.5 U	1.4 J	1.9 J
Ethylbenzene	5.7	6.4	NS	NR	1.3	0.64 J	0.87 UJ	1.1
Hexachlorobutadiene	6.8	0.5	NS	NR	2.1 U	2.1 U	2.1 UJ	2.1 U
Isopropanol	250	NS	NS	550 D	24	3.6 J	8.3 J	7.2 J
Isopropylbenzene (Cumene)	NS	0.8	NS	NR	0.98 U	0.98 U	0.98 UJ	0.98 U
M,P-Xylenes	22.2	11	NS	NR	2.8	2.5	2.2 UJ	4
Methyl Ethyl Ketone (2-Butanone)	12	16	NS	NR	7.5	1.8	0.96 J	1.1 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	6	1.9	NS	NR	2 U	2 U	2 UJ	1.4 J
Methyl Methacrylate	NS	0.4	NS	NR	2 U	2 U	2 UJ	2 U
Methylene Chloride	10	16	1,000	NR	1.7 U	2.6	1.7 UJ	0.61 J
Naphthalene	5.1	NS	NS	NR	2.6 U	2.6 UJ	2.6 UJ	
N-Butylbenzene	NS	1.1	NS	NR	1.1 U	1.1 U	1.1 UJ	1.1 U
N-Heptane	NS	18	NS	NR	0.82 U	0.82 U	0.82 UJ	1
N-Hexane	10.2	14	NS	NR	1.8 U	1.8 U	1.8 UJ	1.8
N-Propylbenzene	NS	1.5	NS	NR	0.98 U	0.98 U	0.98 UJ	0.23 J
O-Xylene (1,2-Dimethylbenzene)	7.9	7.1	NS	NR	3.2	0.84 J	0.87 UJ	1.3
Sec-Butylbenzene	NS	1.2	NS	NR	1.1 U	1.1 U	1.1 UJ	1.1 U
Styrene	1.9	1.4	NS	NR	0.85 U	0.17 J	0.85 UJ	0.85 U
T-Butylbenzene	NS	1.3	NS	NR	1.1 U	1.1 U	1.1 UJ	1.1 U
Tert-Butyl Alcohol	NS	NS	NS	NR	15 U	15 U	15 UJ	15 U
Tert-Butyl Methyl Ether	11.5	14	NS	NR	0.72 U	0.72 U	0.72 UJ	0.72 U
Tetrachloroethylene (PCE)	15.9	2.5	1,000	NR	24	9.9	0.46 J	2.7
Tetrahydrofuran	NS	0.8	NS	NR	15 UJ	15 U	15 UJ	15 U
Toluene	43	57	NS	NR	2.2	5.1	1.8 J	7.1
Trans-1,2-Dichloroethene	NS	NS	NS	NR	0.79 U	0.79 U	0.79 UJ	0.79 U
Trans-1,3-Dichloropropene	1.3	ND	NS	NR	0.91 U	0.91 U	0.91 UJ	0.91 U
Trichloroethylene (TCE)	4.2	0.5	60	NR	6.6	3.4	0.19 UJ	0.19 U
Trichlorofluoromethane	18.1	12	NS	NR	1.6	1.2	0.87 J	1.1
Vinyl Bromide	NS	NS	NS	NR	0.87 U	0.87 U	0.87 UJ	0.87 U
Vinyl Chloride	1.9	0.4	60	NR	0.09 U	0.09 U	0.09 UJ	0.09 U

Tables 2-5
34 Berry Street
Brooklyn, New York
Notes

DEFINITIONS

D	:	Indicates an identified compound in an analysis that has been diluted. This flag alerts the data user to any differences between the concentrations reported in the two analyses.
J	:	The concentration given is an estimated value.
L	:	Sample result is estimated and biased low.
ND	:	The standard is a non-detectable concentration by the approved analytical method.
NR	:	Not reported.
NS	:	No standard.
R	:	Indicates that a quality control parameter has exceeded laboratory limits.
T	:	Indicates that a quality control parameter has exceeded laboratory limits.
U	:	The analyte was not detected at the indicated concentration.
µg/L	:	micrograms per Liter
µg/m^3	:	micrograms per cubic meter

STANDARDS

NYSDEC Class GA AWQSGVs	:	New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (1.1.1): Class GA Ambient Water Quality Standards and Guidance Values (AWQSGVs).

Exceedances of NYSDEC Class GA AWQSGVs are highlighted in bold font.

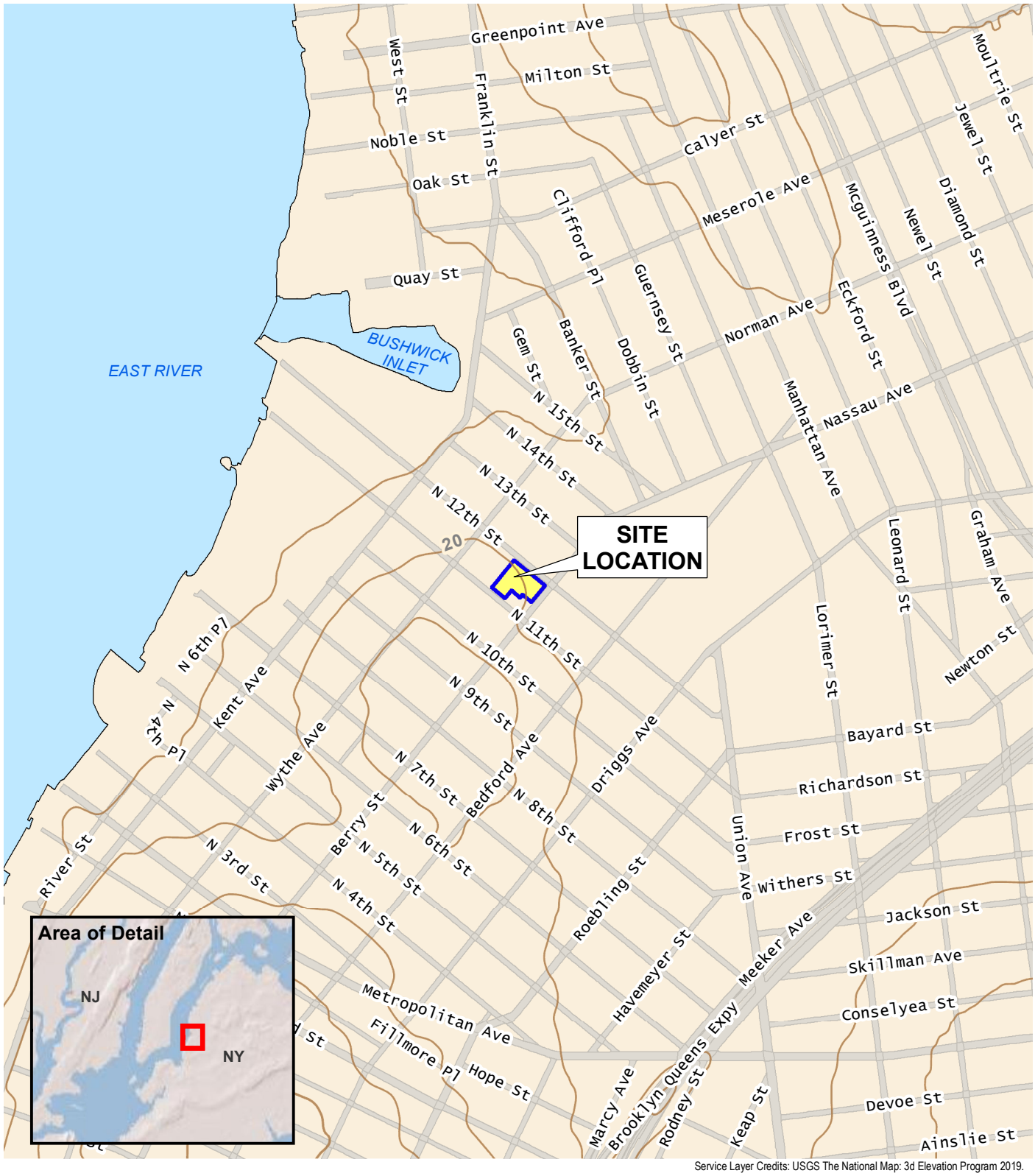
NYSDOH Soil Vapor Intrusion Value	:	New York State Department of Health (NYSDOH) May 2017 for NYSDOH Matrices A, B, and C for PCE, TCE, c1,2-DCE, 1,1-DCE, carbon tetrachloride, 1,1,1-TCA, methylene chloride, and vinyl chloride. The matrix values listed are the sub-slab soil vapor concentration where mitigation is recommended regardless of the indoor air concentration.
NYSDOH 2003 Soil Vapor Indoor Upper Fence	:	Upper fence indoor air values from "Table C1. NYSDOH 2003: Study of Volatile Organic Chemicals in Air of Fuel Oil Heated Homes", published in the "NYSDOH Soil Vapor Intrusion Guidance Document, Appendix C" (October 2006).
EPA 2001 BASE 90th Percentile	:	90th percentile indoor air values from "Table C2. United States Environmental Protction Agency (EPA) 2001: Building Assessment and Survey Evaluation (BASE) Database, SUMMA canister method," published in the New York State Department of Health (NYSDOH) Soil Vapor Intrusion Guidance Document, Appendix C (October 2006).

Exceedances of NYSDOH Soil Vapor Intrusion Air Guidance Matrix Values are highlighted in gray.

DUPLICATES

MW-X_20200610 is a blind duplicate of sample MW-04_20200610.
MW-0X_20200902 is a blind duplicate of sample MW-07_20200902.
MW-0X_20210121 is a blind duplicate of sample MW-04_20210121.
MW-0X_20210915 is a blind duplicate of sample MW-04_20210915.
MW-0X_20220111 is a blind duplicate of sample MW-04_20220111.
MW-0X_20220524 is a blind duplicate of sample MW-01_20220111.
SG-X_20181024 is a blind duplicate of sample SG-02_20181024.
SG-0X_20210917 is a blind duplicate of sample SG-02_20210917.
SG-0X_20220525 is a blind duplicate of sample SG-03_20220525.

FIGURES



Service Layer Credits: USGS The National Map: 3d Elevation Program 2019.

0 800 1,600

SCALE IN FEET

©2021 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\GIS\11259 Fig 1 Site Location.mxd 12/13/2021 8:50:37 AM mveilleux

AKRF
440 Park Avenue South, New York, NY 10016

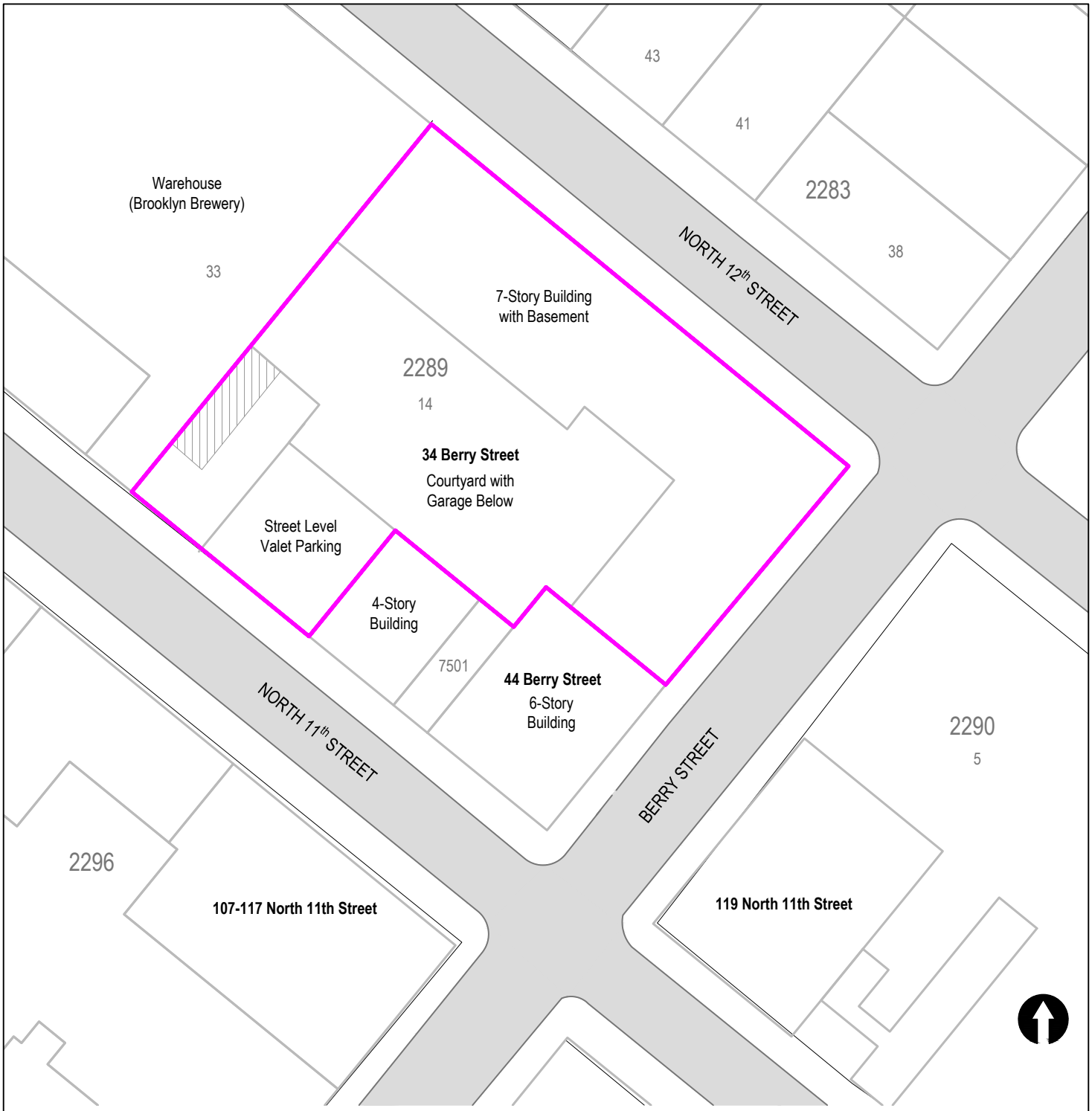
34 Berry Street
Brooklyn, New York

BROWNFIELD CLEANUP PROGRAM
SITE LOCATION

DATE
12/13/2021

PROJECT NO.
11259

FIGURE
1



LEGEND

- BCP SITE BOUNDARY
- 2289 — LOT BOUNDARY AND TAX LOT NUMBER
- 14 — BLOCK NUMBER

0 30 60 120

SCALE IN FEET

AKRF

440 Park Avenue South, New York, NY 10016

34 Berry Street

Brooklyn, New York

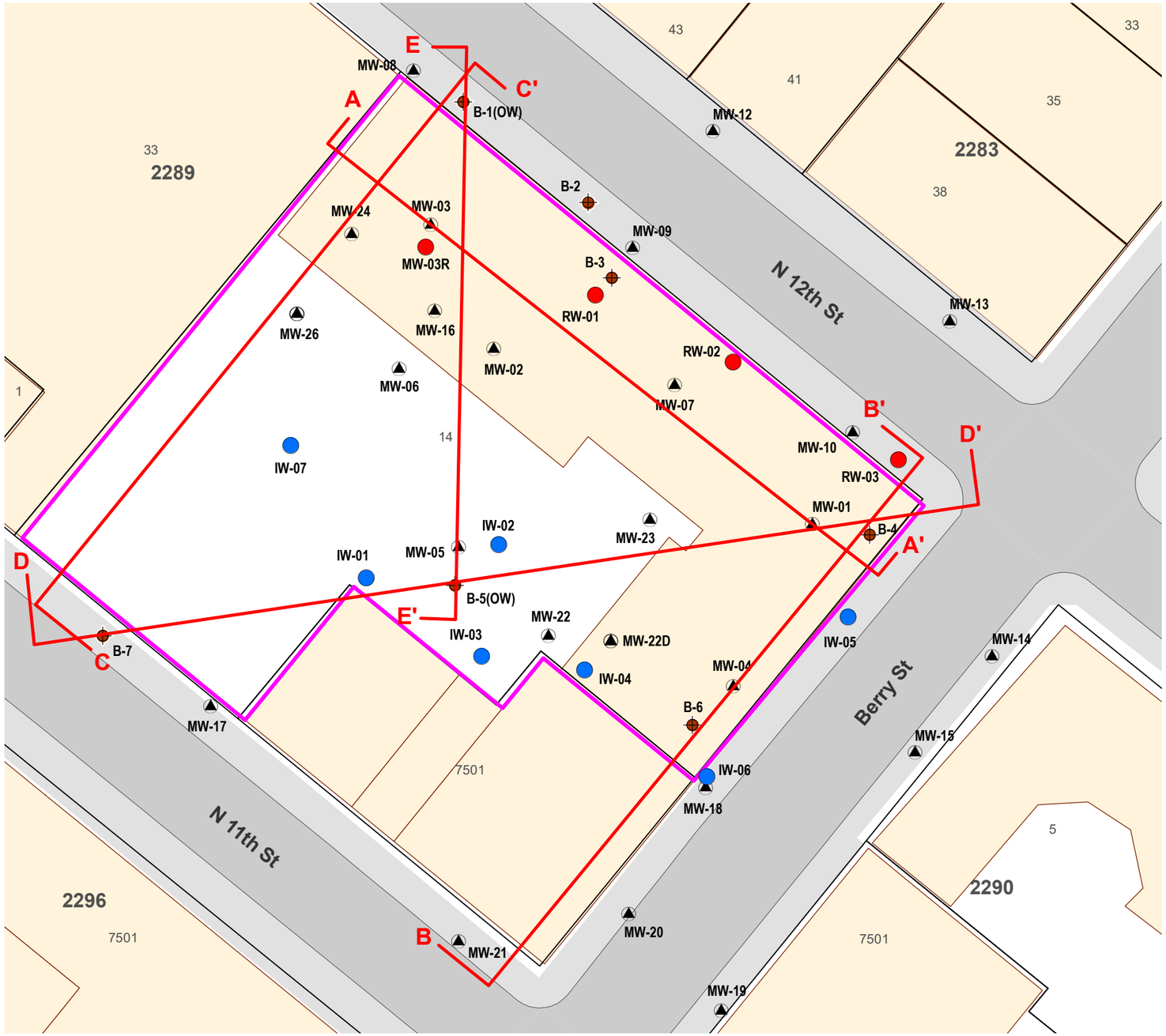
SITE PLAN SHOWING BCP SITE BOUNDARY

DATE
12/13/2021

PROJECT NO.
11259

FIGURE
2

©2021 AKRF, Inc M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\CAD\11259 Fig 2 Site Plan RIR.dwg last save: mveilleux 12/13/2021 8:54 AM



LEGEND

- PROJECT SITE BOUNDARY
- 14 LOT BOUNDARY AND TAX LOT NUMBER
- 2289 BLOCK NUMBER
- BUILDING
- MONITORING WELL LOCATION
- APPROXIMATE LOCATION OF LANGAN GEOTECHNICAL BORING (2006)
- INJECTION WELL LOCATION
- EXTRACTION WELL LOCATION
- CROSS SECTION LOCATION

0 20 40 80

SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database.

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34 Berry Street
Brooklyn, New York

GEOLOGIC CROSS SECTION KEY MAP

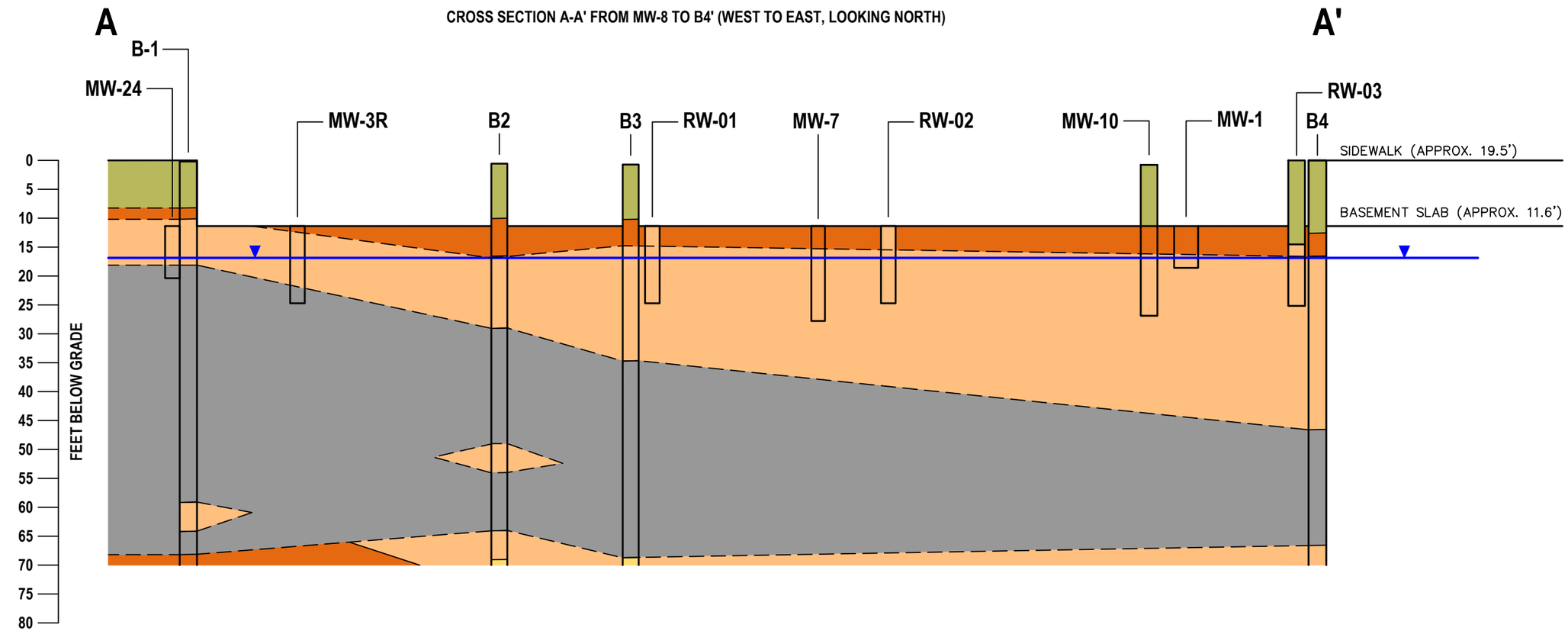
DATE
1/25/2022

PROJECT NO.
11259

FIGURE
3

©2022 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\GIS\SMP\11259 Fig 3 Cross Section Key Map.mxd1/25/2022 11:00:10 AM mvellieux

CROSS SECTION A-A' FROM MW-8 TO B4' (WEST TO EAST, LOOKING NORTH)



LEGEND

- FILL
- SILT
- SAND
- CLAY/SILT
- GEOLOGIC CONTACT
- WATER TABLE

0 10 20 40

SCALE IN FEET

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34 Berry Street
Brooklyn, New York

GEOLOGIC CROSS SECTIONS A-A'

DATE
1/25/2022

PROJECT NO.
11259

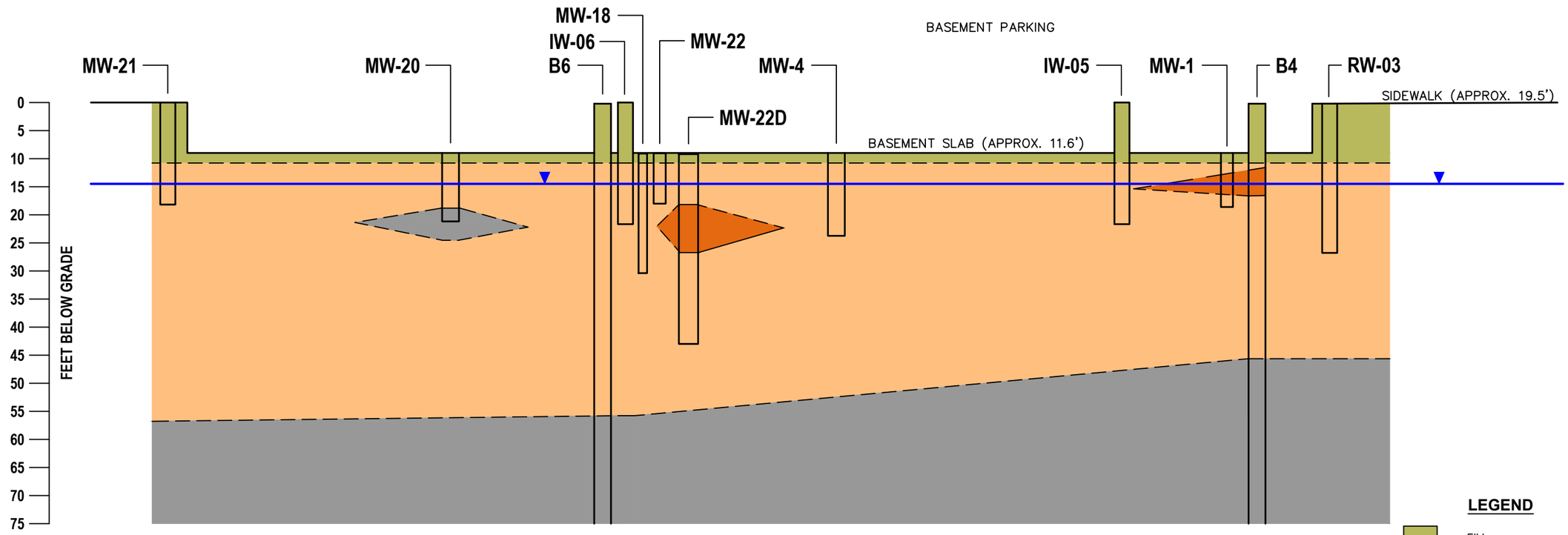
FIGURE
4

©2022 AKRF, Inc M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\CAD\2021\SMP\111259 Figs 4,5,6 Sections.dwg last save: mveilleux 1/25/2022 1:40 PM

B

CROSS SECTION B-B' FROM MW-21 TO MW-10 (SOUTH TO NORTH, LOOKING WEST)

B'



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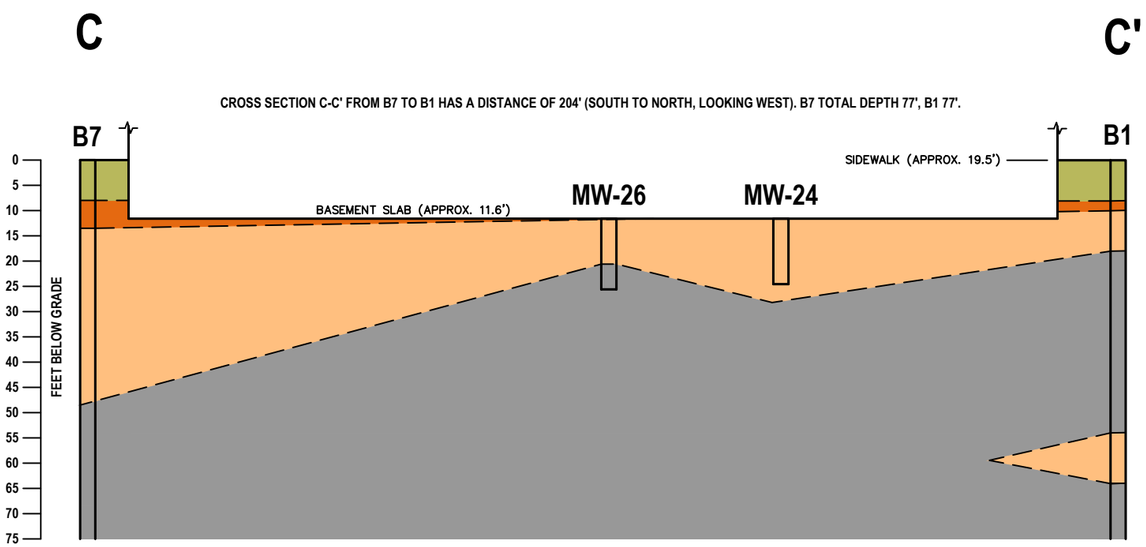
GEOLOGIC CROSS SECTIONS B-B'

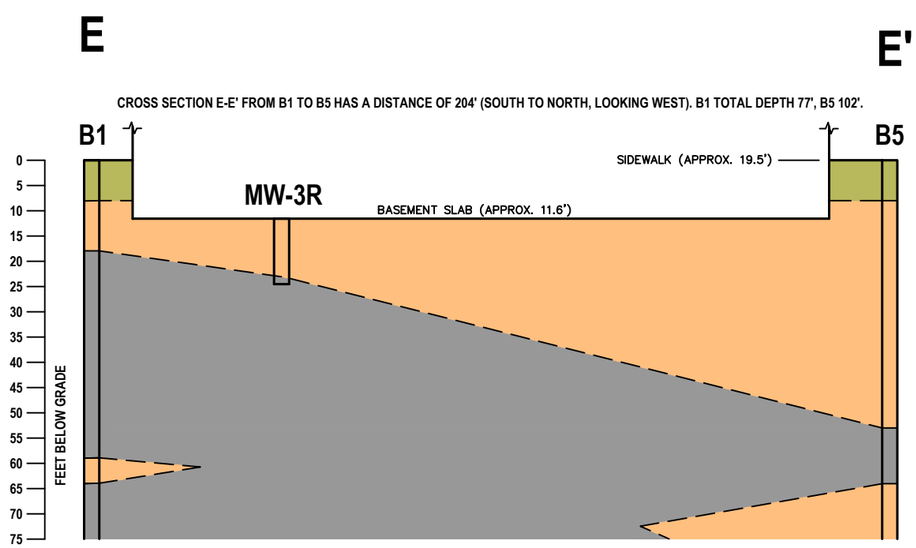
DATE
1/25/2022

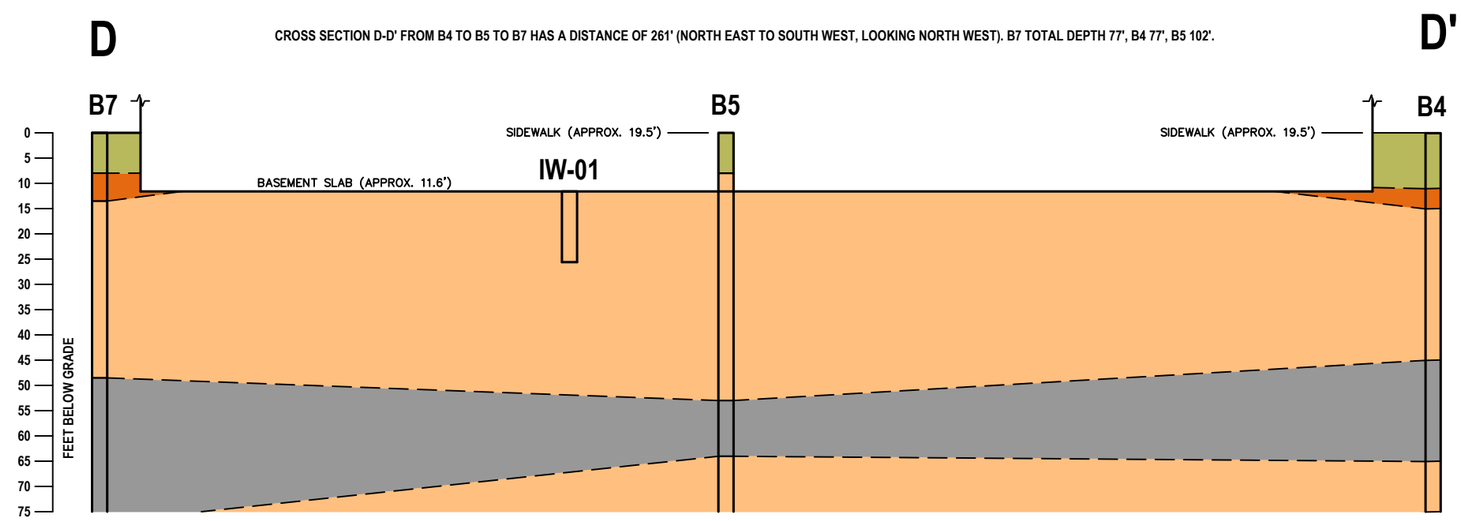
PROJECT NO.
11259

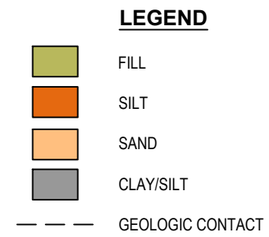
FIGURE
5

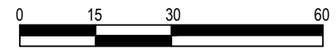
©2022 AKRF, Inc M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\CAD\2021\SMP\111259 Figs 4-5,6 Sections.dwg last save: mveilleux 1/25/2022 1:14 PM











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Brooklyn, New York

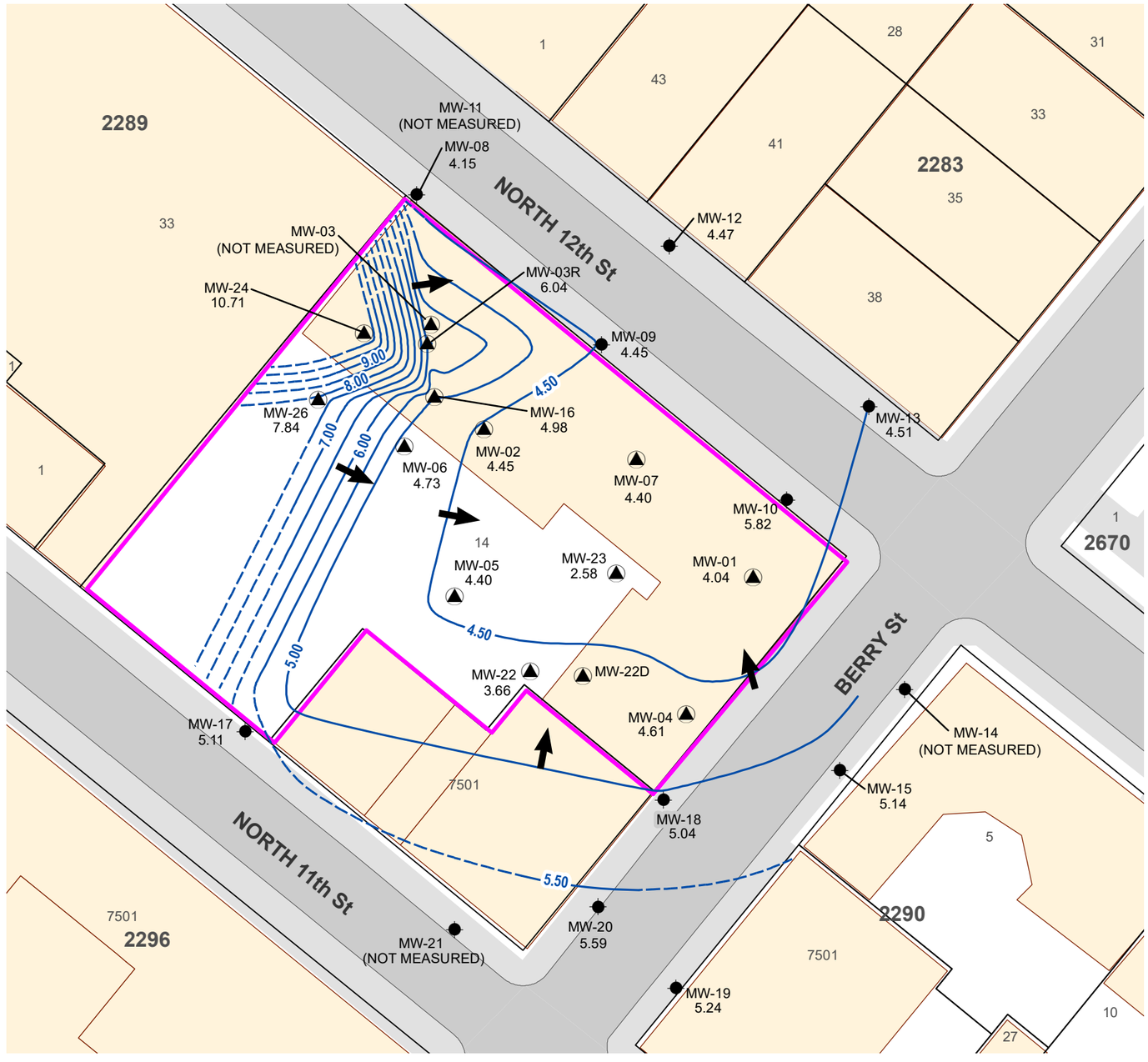
GEOLOGIC CROSS SECTIONS C-C', D-D', E-E'

DATE
1/25/2022

PROJECT NO.
11259

FIGURE
6

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Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database.

LEGEND

- PROJECT SITE BOUNDARY
- 14 LOT BOUNDARY / TAX LOT NUMBER
- 2289 BLOCK NUMBER
- BUILDING
- WATER TABLE ELEVATION CONTOUR IN FEET (DASHED WHERE INFERRED)
- ON-SITE MONITORING WELL LOCATION
- OFF-SITE MONITORING WELL LOCATION
- GROUNDWATER FLOW DIRECTION

Notes:
1. MW-03 has a damaged well screen and was not used to calculate groundwater flow.

2. The water level measurement in micro well MW-23 was anomalously low; therefore was not used to construct groundwater contours.

3. Elevations are relative to an Assumed Site Datum.

0 25 50 100
SCALE IN FEET

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34 Berry Street
Brooklyn, New York

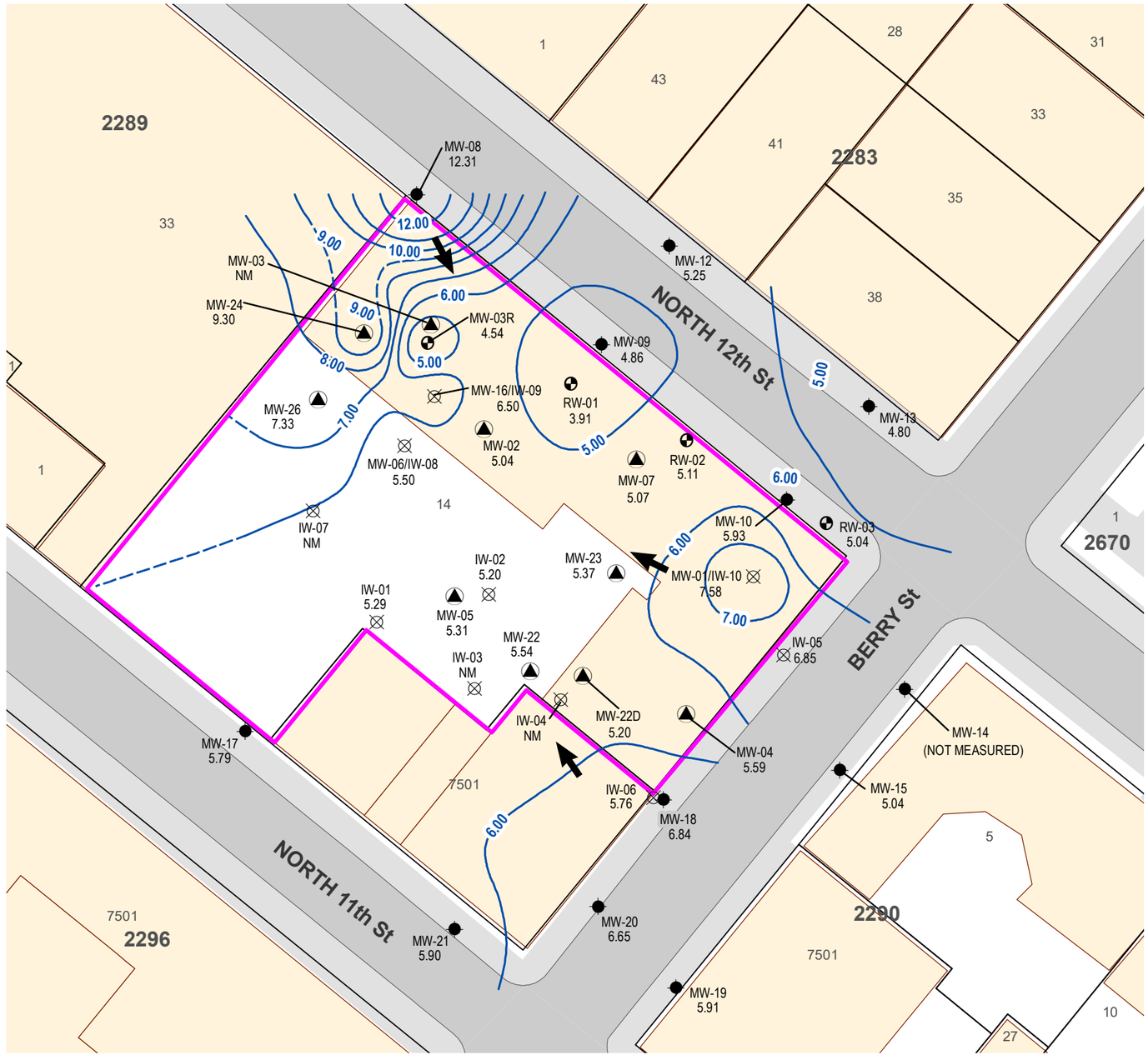
GROUNDWATER CONTOUR MAP UNDER STATIC CONDITIONS - JUNE 11, 2021

DATE
1/19/2022

PROJECT NO.
11259

FIGURE
7

©2022 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\GIS\SMP\11259 Fig 7 GW Contour Map 6-11-2021.mxd1/19/2022 11:48:57 AM mvellieux



Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database.

LEGEND

- PROJECT SITE BOUNDARY
- 14 LOT BOUNDARY / TAX LOT NUMBER
- 2289 BLOCK NUMBER
- BUILDING
- WATER TABLE ELEVATION CONTOUR IN FEET (DASHED WHERE INFERRED)
- ON-SITE MONITORING WELL LOCATION
- OFF-SITE MONITORING WELL LOCATION
- EXTRACTION WELL LOCATION
- INJECTION WELL LOCATION
- GROUNDWATER FLOW DIRECTION

Notes:
1. MW-03 has a damaged well screen and was not used to calculate groundwater flow.
2. Elevations are relative to an Assumed Site Datum.
3. NM = Not Measured.

0 25 50 100
SCALE IN FEET

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34 Berry Street
Brooklyn, New York

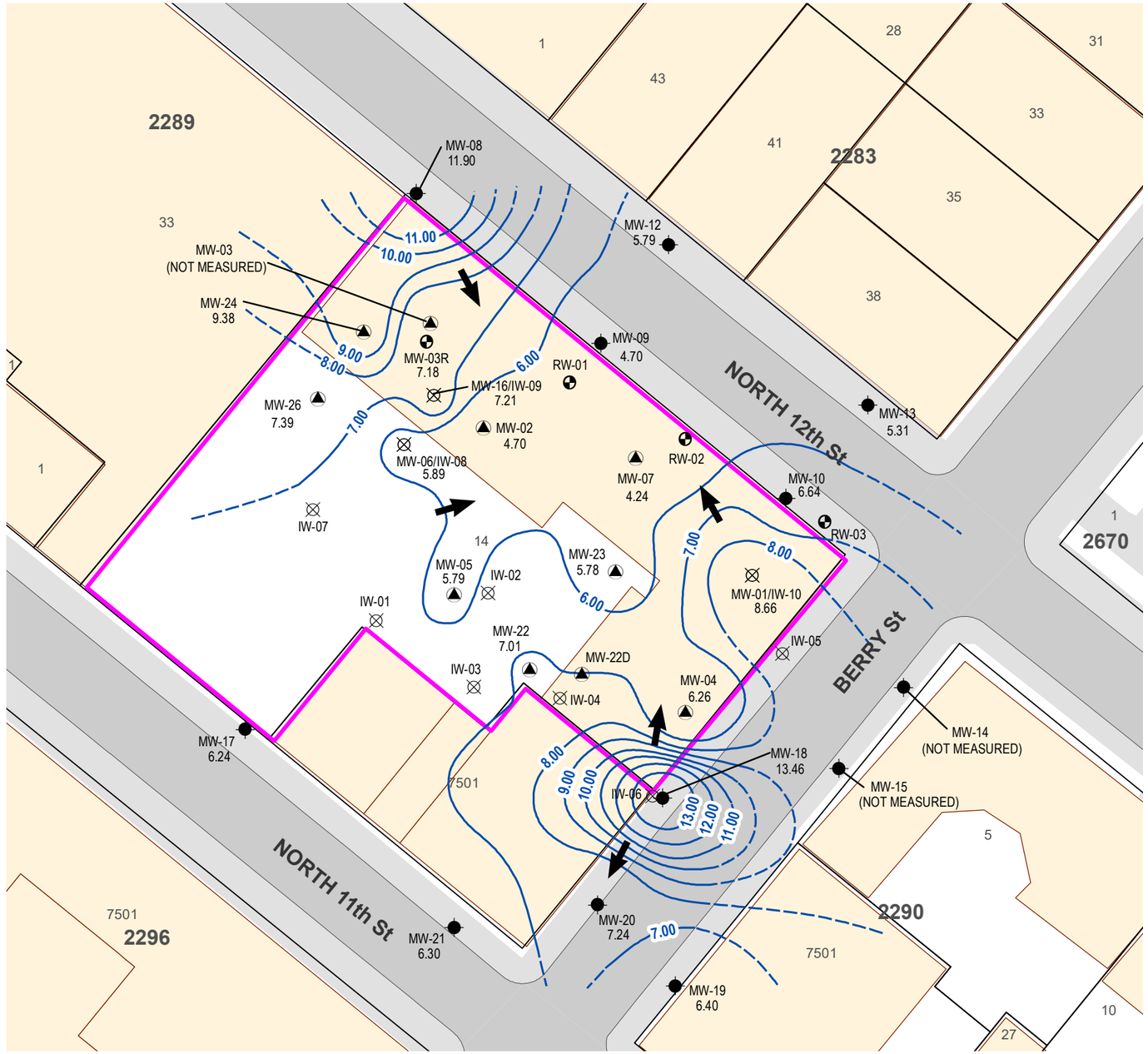
GROUNDWATER CONTOUR MAP UNDER PHASE I PUMPING CONDITIONS - DECEMBER 16, 2021

DATE
1/21/2022

PROJECT NO.
11259

FIGURE
8

©2022 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\GIS\SMP\11259 Fig 8 GW Contour Map 12-16-2021.mxd1/21/2022 2:38:38 PM mveilleux



Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database.

LEGEND

- PROJECT SITE BOUNDARY
- 14 LOT BOUNDARY / TAX LOT NUMBER
- 2289 BLOCK NUMBER
- BUILDING
- WATER TABLE ELEVATION CONTOUR IN FEET (DASHED WHERE INFERRED)
- ON-SITE MONITORING WELL LOCATION
- OFF-SITE MONITORING WELL LOCATION
- INJECTION WELL LOCATION
- EXTRACTION WELL LOCATION
- GROUNDWATER FLOW DIRECTION

Notes:
1. MW-03 has a damaged well screen and was not used to calculate groundwater flow.
2. MW-02 was not used to create the contours due to an anomalous reading.
3. MW-22D was not used to create the contours due to a deeper screening interval.
4. Elevations are relative to an Assumed Site Datum.

0 25 50 100
SCALE IN FEET

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Brooklyn, New York

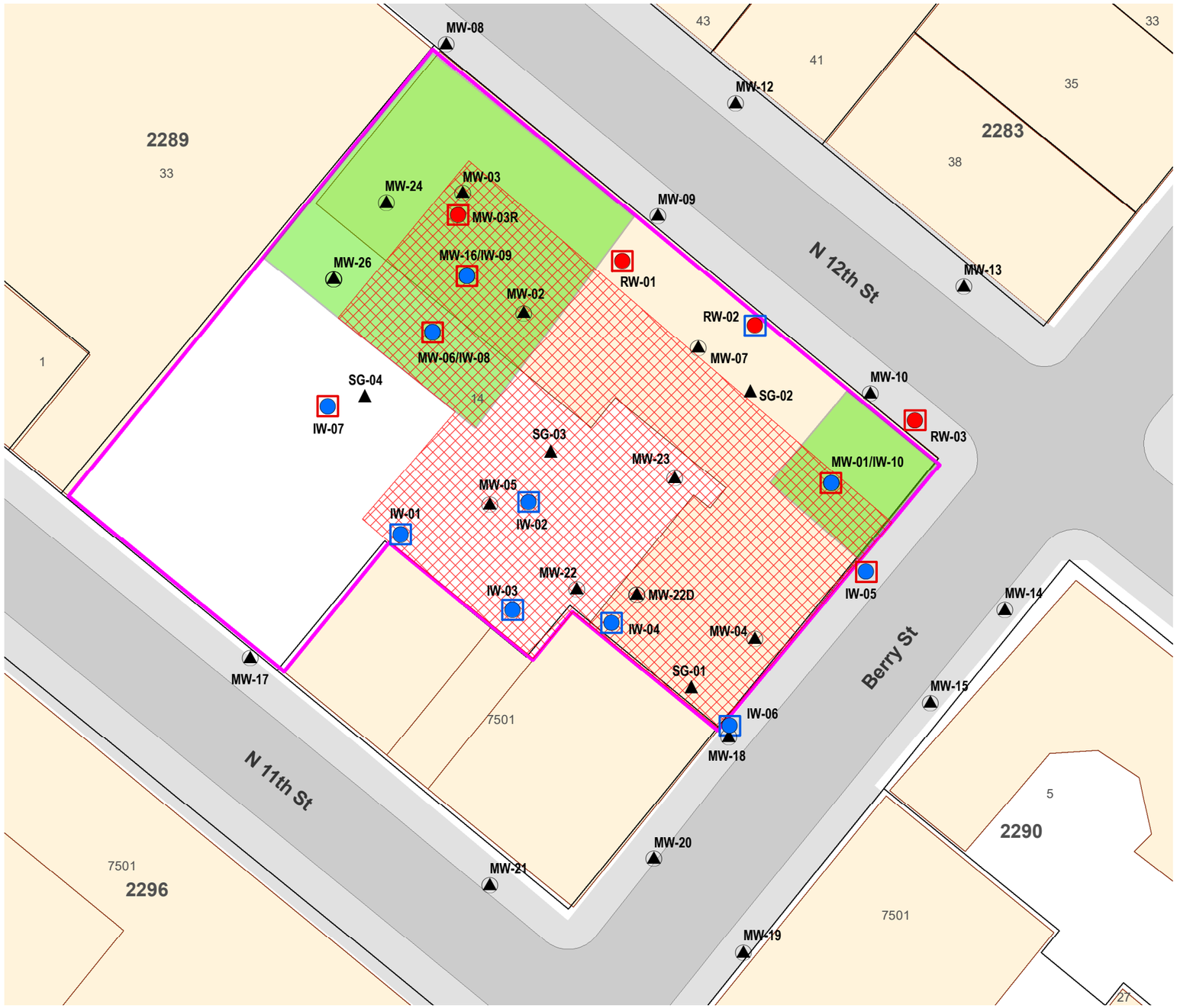
GROUNDWATER CONTOUR MAP UNDER PHASE 2 PUMPING CONDITIONS - May 11, 2022

DATE
5/18/2022

PROJECT NO.
11259

FIGURE
9

©2022 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\GIS\FER\11259 Fig 15 GW Elevation Contour Map – System On Phase 2.mxd 5/18/2022 1:10:37 PM mveilleux



Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database.

LEGEND

- PROJECT SITE BOUNDARY
- 14 LOT BOUNDARY AND TAX LOT NUMBER
- 2289 BLOCK NUMBER
- BUILDING
- INJECTION WELL LOCATION
- EXTRACTION WELL LOCATION
- MONITORING WELL LOCATION
- APPROXIMATE AREA OF 1,2-DCA REMEDIATION (PHASE II)
- APPROXIMATE AREA OF PETROLUEM REMEDIATION (PHASE I)
- SUB-SLAB SOIL GAS POINT LOCATION
- PHASE I AND II GROUNDWATER TREATMENT WELL
- PHASE II GROUNDWATER TREATMENT WELL

0 20 40 80
SCALE IN FEET

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34 Berry Street
Brooklyn, New York

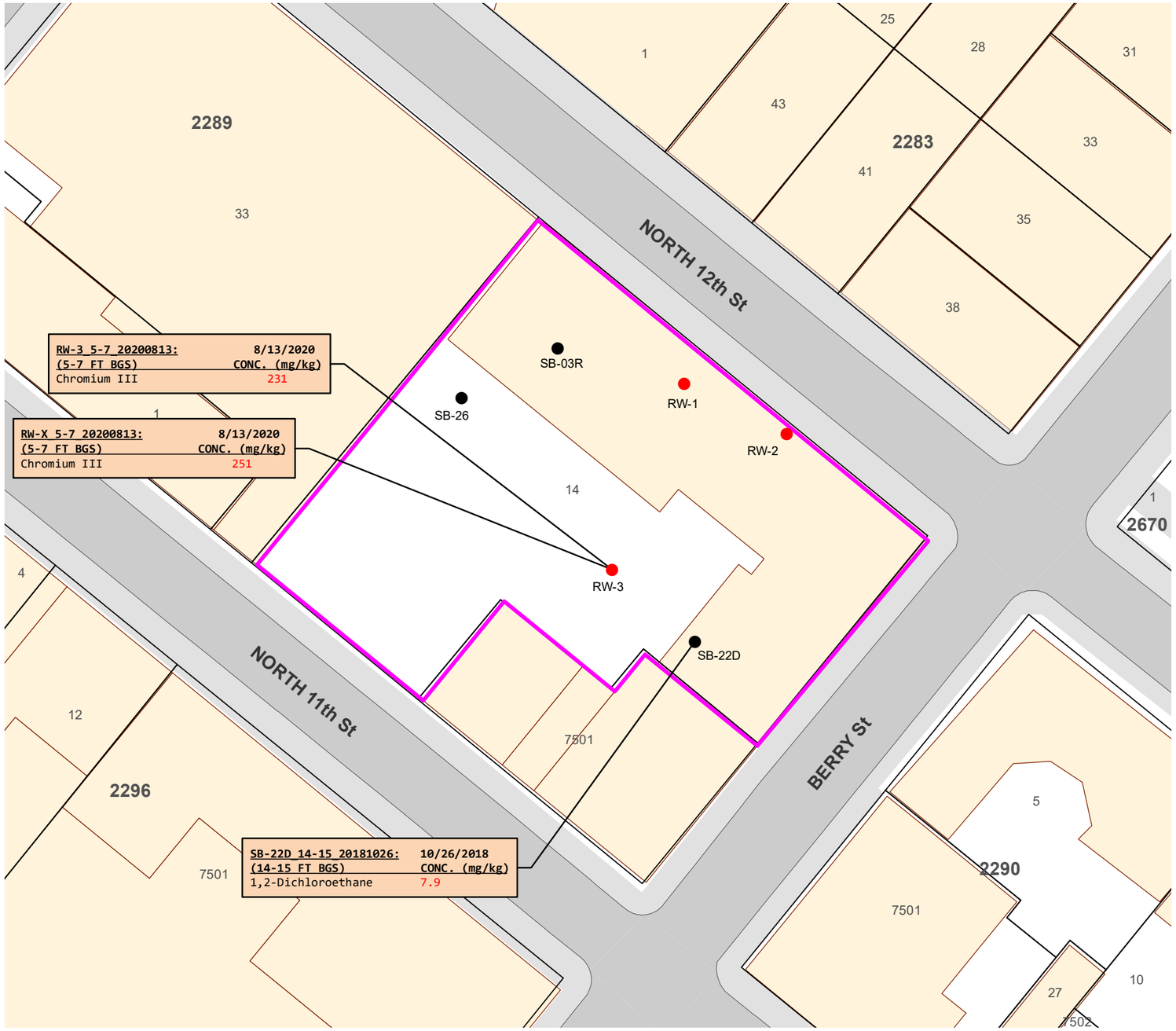
GROUNDWATER WELL AND SUB-SLAB SOIL GAS POINT NETWORK

DATE
1/21/2022

PROJECT NO.
11259

FIGURE
10

©2022 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\GIS\SMP\11259 Fig 10 Groundwater Well and Sub-Slab Soil Gas Point Network.mxd1/21/2022 2:23:24 PM mveilleux



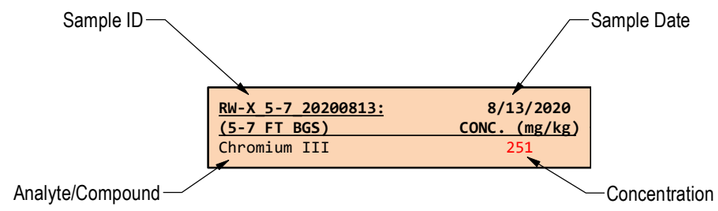
	Track 4 Restricted Residential mg/kg
Volatile Organic Compounds	
1,2-Dichloroethane	3.1
Metals	
Chromium, Trivalent	180

Part 375 Soil Cleanup Objectives:
Soil Cleanup Objectives listed in NYSDEC
(New York State Department of Environmental Conservation)
"Part 375" Regulations (6 NYCRR Part 375).

mg/kg : milligrams per kilogram = parts per million (ppm)

Exceedances of Part 375 Restricted Residential SCOs (RRSCOs) are highlighted in red font.

Blind duplicate sample "RW-X_5-7_20200813" was collected from "RW-3_5-7_20200813"



LEGEND

- PROJECT SITE BOUNDARY
- 14 LOT BOUNDARY AND TAX LOT NUMBER
- 2289 BLOCK NUMBER
- BUILDING
- 2018 RI SOIL BORING LOCATION
- 2021 SUPPLEMENTAL SOIL BORING LOCATION

0 25 50 100
SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

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34 Berry Street
Brooklyn, New York

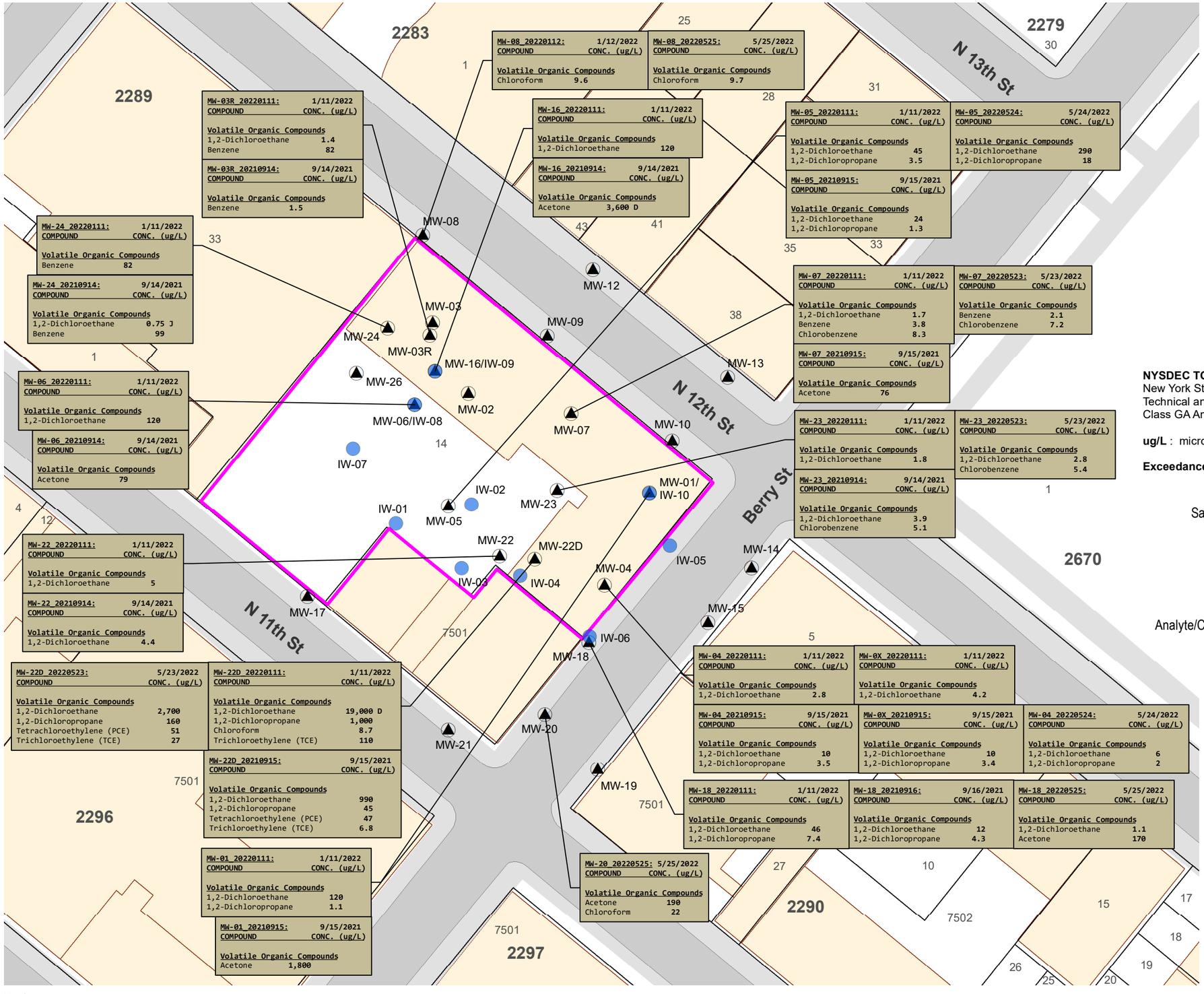
EXTENT OF REMAINING SOIL CONTAMINATION ABOVE TRACK 4 SCOs

DATE
1/21/2022

PROJECT NO.
11259

FIGURE
11

©2022AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\GIS\MP\11259 Fig 11 Extent of Remaining Soil Contamination Above Track 4 SCOs.mxd1/21/2022 2:47:33 PM mveilleux



	NYSDEC AWQSGVs ug/l
Volatile Organic Compounds	
1,2-Dichloroethane	0.6
1,2-Dichloropropane	1
Acetone	50
Benzene	1
Chlorobenzene	5
Chloroform	7
Tetrachloroethylene (PCE)	5
Trichloroethylene (TCE)	5

NYSDEC TOGS Class GA Ambient Water Quality Standard (AWQS):
New York State Department of Environmental Conservation (NYSDEC) Technical and Operational Guidance Series (TOGS) (1.1.1):
Class GA Ambient Water Quality Standards and Guidance Values (AWQS)

ug/L : micrograms per Liter = parts per billion (ppb)

Exceedances of NYSDEC NYSDEC TOGS are shown in bold font.

Sample ID — Sample Date

MW-06 20220111: 1/11/2022
COMPOUND CONC. (ug/L)
Volatile Organic Compounds
1,2-Dichloroethane 120

Analyte/Compound — Concentration

LEGEND

- PROJECT SITE BOUNDARY
- BUILDING
- 14 — LOT BOUNDARY AND TAX LOT NUMBER
- MONITORING WELL LOCATION
- INJECTION WELL LOCATION

0 30 60 120
SCALE IN FEET

Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

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Brooklyn, New York

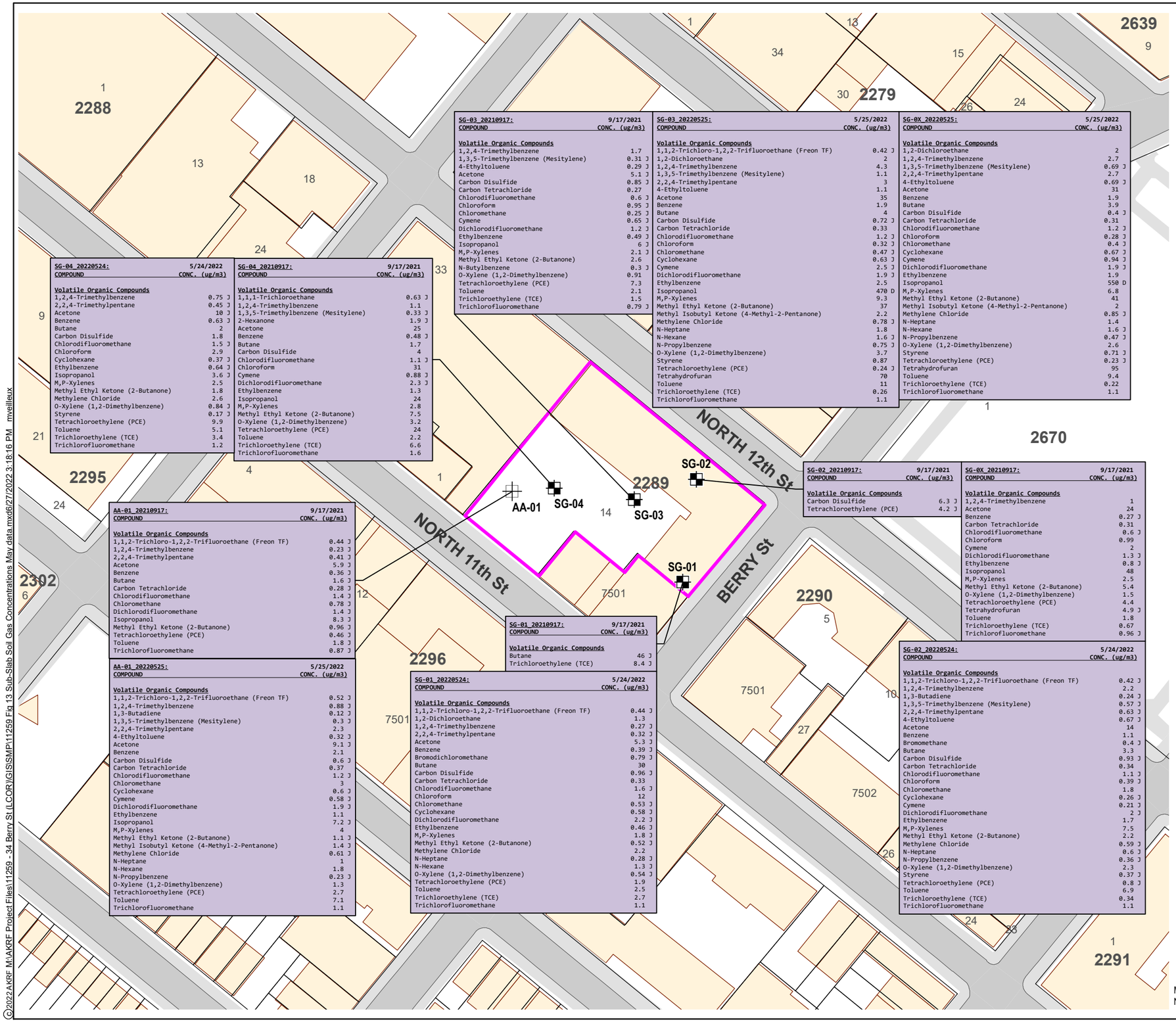
EXTENT OF REMAINING GROUNDWATER CONTAMINATION ABOVE AWQSS

DATE
7/7/2022

PROJECT NO.
11259

FIGURE
12

©2022 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\GIS\SMP\11259 Fig 12 Extent of Remaining Groundwater Contamination Above AWQSs May data.mxd7/7/2022 1:58:02 PM mveilleux



SG-03_20210917:	9/17/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	1.7
1,3,5-Trimethylbenzene (Mesitylene)	0.31 J
4-Ethyltoluene	0.29 J
Acetone	5.1 J
Carbon Disulfide	0.85 J
Carbon Tetrachloride	0.27
Chlorodifluoromethane	0.6 J
Chloroform	0.95 J
Chloromethane	0.25 J
Cymene	0.65 J
Dichlorodifluoromethane	1.2 J
Ethylbenzene	0.49 J
Isopropanol	6 J
M,P-Xylenes	2.1 J
Methyl Ethyl Ketone (2-Butanone)	2.6
N-Butylbenzene	0.3 J
O-Xylene (1,2-Dimethylbenzene)	0.91 J
Tetrachloroethylene (PCE)	7.3
Toluene	2.1
Trichloroethylene (TCE)	1.5
Trichlorofluoromethane	0.79 J

SG-03_20220525:	5/25/2022
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	0.42 J
1,2-Dichloroethane	2
1,2,4-Trimethylbenzene	4.3
1,3,5-Trimethylbenzene (Mesitylene)	1.1
2,2,4-Trimethylpentane	3
4-Ethyltoluene	1.1
Acetone	35
Benzene	1.9
Butane	4
Carbon Disulfide	0.72 J
Carbon Tetrachloride	0.33
Chlorodifluoromethane	1.2 J
Chloroform	0.32 J
Chloromethane	0.47 J
Cyclohexane	0.63 J
Cymene	2.5 J
Dichlorodifluoromethane	1.9 J
Ethylbenzene	2.5
Isopropanol	470 D
M,P-Xylenes	9.3
Methyl Ethyl Ketone (2-Butanone)	37
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2.2
Methylene Chloride	0.78 J
N-Heptane	1.8
N-Hexane	1.6 J
N-Propylbenzene	0.75 J
O-Xylene (1,2-Dimethylbenzene)	3.7
Styrene	0.87
Tetrachloroethylene (PCE)	0.24 J
Tetrahydrofuran	70
Toluene	11
Trichloroethylene (TCE)	0.26
Trichlorofluoromethane	1.1

SG-0X_20220525:	5/25/2022
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,2-Dichloroethane	2
1,2,4-Trimethylbenzene	2.7
1,3,5-Trimethylbenzene (Mesitylene)	0.69 J
2,2,4-Trimethylpentane	2.7
4-Ethyltoluene	0.69 J
Acetone	31
Benzene	1.9
Butane	3.9
Carbon Disulfide	0.4 J
Carbon Tetrachloride	0.31
Chlorodifluoromethane	1.2 J
Chloroform	0.28 J
Chloromethane	0.4 J
Cyclohexane	0.67 J
Cymene	0.94 J
Dichlorodifluoromethane	1.9 J
Ethylbenzene	1.9
Isopropanol	550 D
M,P-Xylenes	6.8
Methyl Ethyl Ketone (2-Butanone)	41
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	2
Methylene Chloride	0.85 J
N-Heptane	1.4
N-Hexane	1.6 J
N-Propylbenzene	0.47 J
O-Xylene (1,2-Dimethylbenzene)	2.6
Styrene	0.71 J
Tetrachloroethylene (PCE)	0.23 J
Tetrahydrofuran	95
Toluene	9.4
Trichloroethylene (TCE)	0.22
Trichlorofluoromethane	1.1

SG-04_20220524:	5/24/2022
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	0.75 J
2,2,4-Trimethylpentane	0.45 J
Acetone	10 J
Benzene	0.63 J
Butane	2
Carbon Disulfide	1.8
Chlorodifluoromethane	1.5 J
Chloroform	2.9
Cyclohexane	0.37 J
Ethylbenzene	0.64 J
Isopropanol	3.6 J
M,P-Xylenes	2.5
Methyl Ethyl Ketone (2-Butanone)	1.8
Methylene Chloride	2.6
O-Xylene (1,2-Dimethylbenzene)	0.84 J
Styrene	0.17 J
Tetrachloroethylene (PCE)	9.9
Toluene	5.1
Trichloroethylene (TCE)	3.4
Trichlorofluoromethane	1.2

SG-04_20210917:	9/17/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,1-Trichloroethane	0.63 J
1,2,4-Trimethylbenzene	1.1
1,3,5-Trimethylbenzene (Mesitylene)	0.33 J
2-Hexanone	1.9 J
Acetone	25
Benzene	0.48 J
Butane	1.7
Carbon Disulfide	4
Chlorodifluoromethane	1.1 J
Chloroform	31
Cymene	0.88 J
Dichlorodifluoromethane	2.3 J
Ethylbenzene	1.3
Isopropanol	24
M,P-Xylenes	2.8
Methyl Ethyl Ketone (2-Butanone)	7.5
O-Xylene (1,2-Dimethylbenzene)	3.2
Tetrachloroethylene (PCE)	24
Toluene	2.2
Trichloroethylene (TCE)	6.6
Trichlorofluoromethane	1.6

SG-02_20210917:	9/17/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
Carbon Disulfide	6.3 J
Tetrachloroethylene (PCE)	4.2 J

SG-0X_20210917:	9/17/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	1
Acetone	24
Benzene	0.27 J
Carbon Tetrachloride	0.31
Chlorodifluoromethane	0.6 J
Chloroform	0.99
Cymene	2
Dichlorodifluoromethane	1.3 J
Ethylbenzene	0.8 J
Isopropanol	48
M,P-Xylenes	2.5
Methyl Ethyl Ketone (2-Butanone)	5.4
O-Xylene (1,2-Dimethylbenzene)	1.5
Tetrachloroethylene (PCE)	4.4
Tetrahydrofuran	4.9 J
Toluene	1.8
Trichloroethylene (TCE)	0.67
Trichlorofluoromethane	0.96 J

AA-01_20210917:	9/17/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	0.44 J
1,2,4-Trimethylbenzene	0.23 J
2,2,4-Trimethylpentane	0.41 J
Acetone	5.9 J
Benzene	0.36 J
Butane	1.6 J
Carbon Tetrachloride	0.28 J
Chlorodifluoromethane	1.4 J
Chloromethane	0.78 J
Dichlorodifluoromethane	1.4 J
Isopropanol	8.3 J
Methyl Ethyl Ketone (2-Butanone)	0.96 J
Tetrachloroethylene (PCE)	0.46 J
Toluene	1.8 J
Trichlorofluoromethane	0.87 J

AA-01_20220525:	5/25/2022
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	0.52 J
1,2,4-Trimethylbenzene	0.88 J
1,3-Butadiene	0.12 J
1,3,5-Trimethylbenzene (Mesitylene)	0.3 J
2,2,4-Trimethylpentane	2.3
4-Ethyltoluene	0.32 J
Acetone	9.1 J
Benzene	2.1
Carbon Disulfide	0.6 J
Carbon Tetrachloride	0.37
Chlorodifluoromethane	1.2 J
Chloromethane	3
Cyclohexane	0.6 J
Cymene	0.58 J
Dichlorodifluoromethane	1.9 J
Ethylbenzene	1.1
Isopropanol	7.2 J
M,P-Xylenes	4
Methyl Ethyl Ketone (2-Butanone)	1.1 J
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	1.4 J
Methylene Chloride	0.61 J
N-Heptane	1
N-Hexane	1.8
N-Propylbenzene	0.23 J
O-Xylene (1,2-Dimethylbenzene)	1.3
Tetrachloroethylene (PCE)	2.7
Toluene	7.1
Trichlorofluoromethane	1.1

SG-01_20210917:	9/17/2021
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
Butane	46 J
Trichloroethylene (TCE)	8.4 J

SG-01_20220524:	5/24/2022
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	0.44 J
1,2-Dichloroethane	1.3
1,2,4-Trimethylbenzene	0.27 J
2,2,4-Trimethylpentane	0.32 J
Acetone	5.3 J
Benzene	0.39 J
Bromodichloromethane	0.79 J
Butane	30
Carbon Disulfide	0.96 J
Carbon Tetrachloride	0.33
Chlorodifluoromethane	1.6 J
Chloroform	12
Chloromethane	0.53 J
Cyclohexane	0.58 J
Dichlorodifluoromethane	2.2 J
Ethylbenzene	0.46 J
M,P-Xylenes	1.8 J
Methyl Ethyl Ketone (2-Butanone)	0.52 J
Methylene Chloride	2.2
N-Heptane	0.28 J
N-Hexane	1.3 J
O-Xylene (1,2-Dimethylbenzene)	0.54 J
Tetrachloroethylene (PCE)	1.9
Toluene	2.5
Trichloroethylene (TCE)	2.7
Trichlorofluoromethane	1.1

SG-02_20220524:	5/24/2022
COMPOUND	CONC. (ug/m3)
Volatile Organic Compounds	
1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon TF)	0.42 J
1,2,4-Trimethylbenzene	2.2
1,3-Butadiene	0.24 J
1,3,5-Trimethylbenzene (Mesitylene)	0.57 J
2,2,4-Trimethylpentane	0.63 J
4-Ethyltoluene	0.67 J
Acetone	14
Benzene	1.1
Bromomethane	0.4 J
Butane	3.3
Carbon Disulfide	0.93 J
Carbon Tetrachloride	0.34
Chlorodifluoromethane	1.1 J
Chloroform	0.39 J
Chloromethane	1.8
Cyclohexane	0.26 J
Cymene	0.21 J
Dichlorodifluoromethane	2 J
Ethylbenzene	1.7
M,P-Xylenes	7.5
Methyl Ethyl Ketone (2-Butanone)	2.2
Methylene Chloride	0.59 J
N-Heptane	0.6 J
N-Propylbenzene	0.36 J
O-Xylene (1,2-Dimethylbenzene)	2.3
Styrene	0.37 J
Tetrachloroethylene (PCE)	0.8 J
Toluene	6.9
Trichloroethylene (TCE)	0.34
Trichlorofluoromethane	1.1

LEGEND

- PROJECT SITE BOUNDARY
- 14 — LOT BOUNDARY AND TAX LOT NUMBER
- 2289 — BLOCK NUMBER
- BUILDING
- AMBIENT AIR SAMPLE
- SUB-SLAB SOIL GAS SAMPLE LOCATION

SOIL VAPOR

NYSDOH Soil Vapor Intrusion Value:
NYSDOH Soil Vapor Intrusion Matrix Values presented in the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006, updated May 2017.

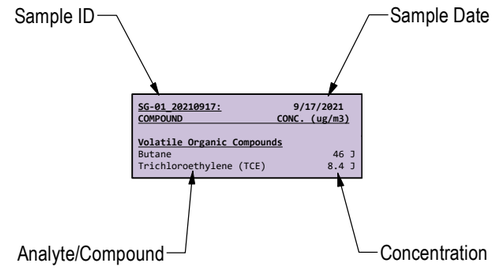
Exceedances of NYSDOH Soil Vapor Intrusion Air Guidance Values are shown in bold font.

µg/m³- micrograms per cubic meter

SG-0X_20210917" is a blind duplicate sample collected at SG-02.

SG-0X_20220525" is a blind duplicate sample collected at SG-03.

J: The concentration given is an estimated value.



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Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database

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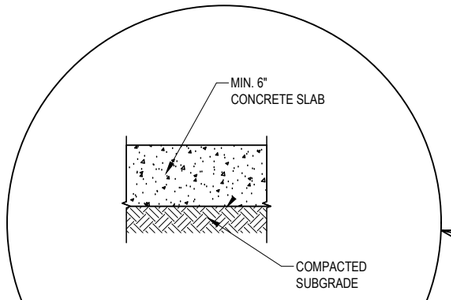
SUB-SLAB SOIL GAS CONCENTRATIONS

DATE
6/27/2022

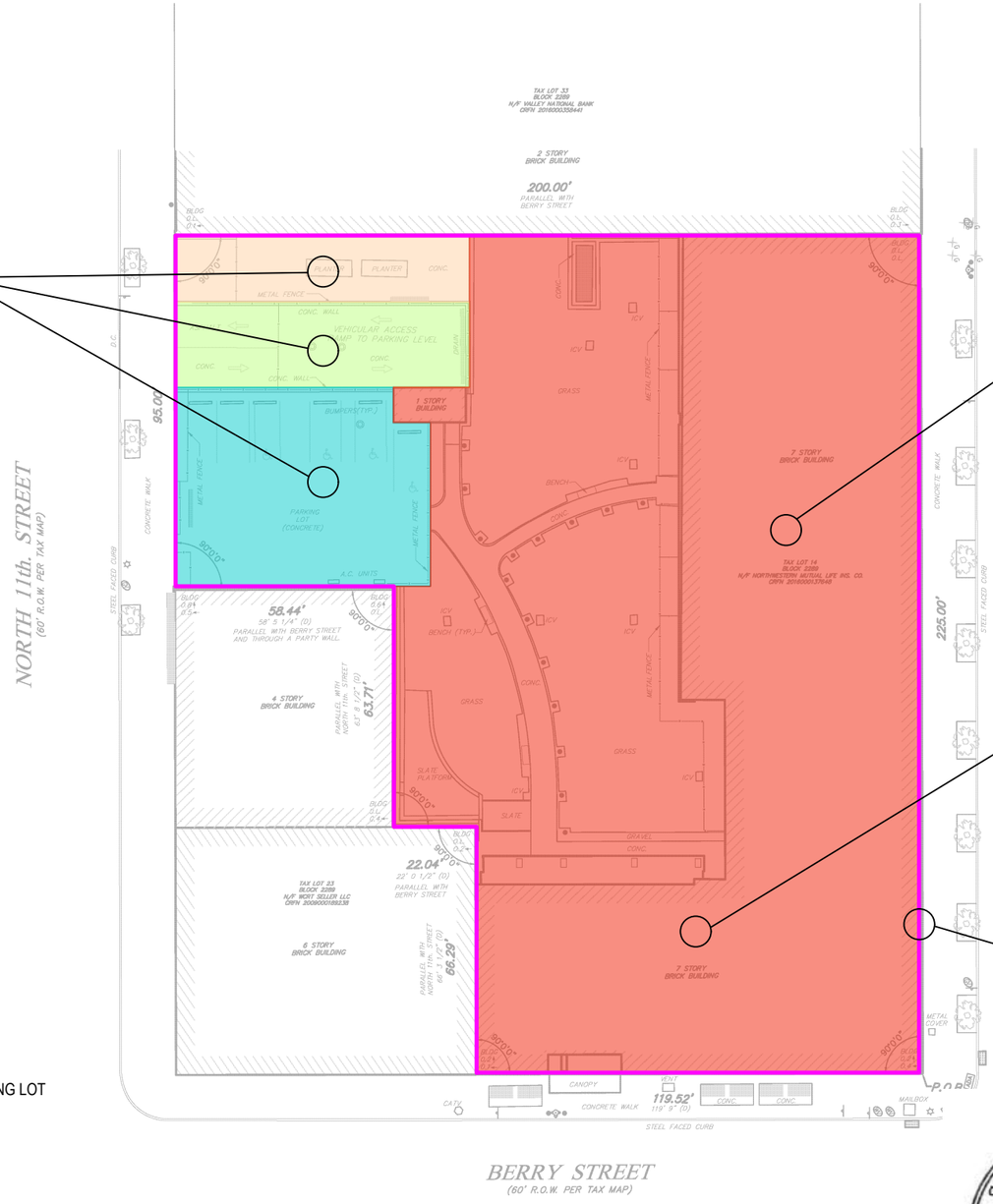
PROJECT NO.
11259

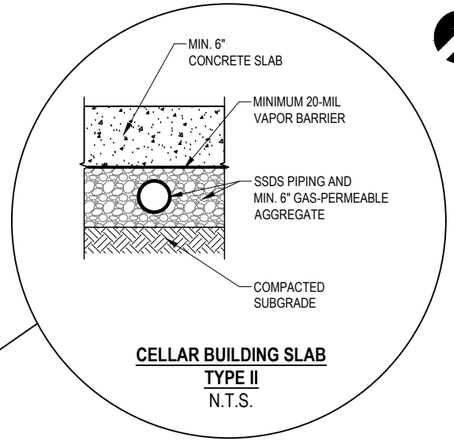
FIGURE
13

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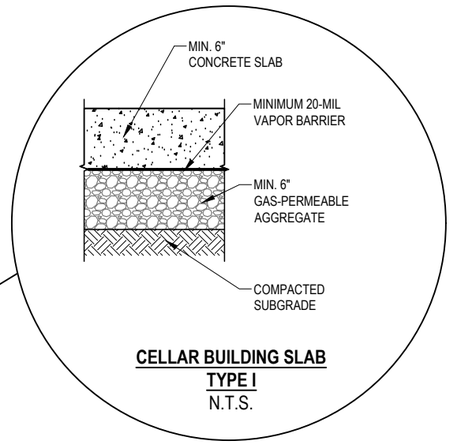


CONCRETE PARKING LOT/ RAMP, AND COURTYARD EXTENSION
N.T.S.

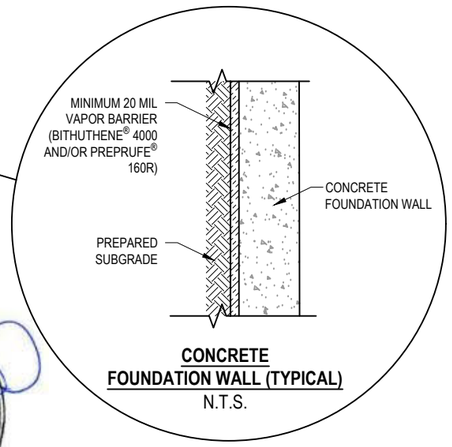




CELLAR BUILDING SLAB TYPE II
N.T.S.



CELLAR BUILDING SLAB TYPE I
N.T.S.



CONCRETE FOUNDATION WALL (TYPICAL)
N.T.S.

LEGEND

- PROJECT SITE BOUNDARY
- CELLAR BUILDING SLAB
- CONCRETE PAVED SURFACE/PARKING LOT
- CONCRETE GARAGE RAMP
- COURTYARD EXTENSION

SOURCE: DPK LAND SURVEYING "BOUNDARY SURVEY, TAX LOT 14, SECTION 8 BLOCK 2289, 34 BERRY STREET, BOROUGH OF BROOKLYN COUNTY OF KINGS CITY AND STATE OF NEW YORK", DRAWING FILE 16-7469TPOO, DATED 11/22/2021.



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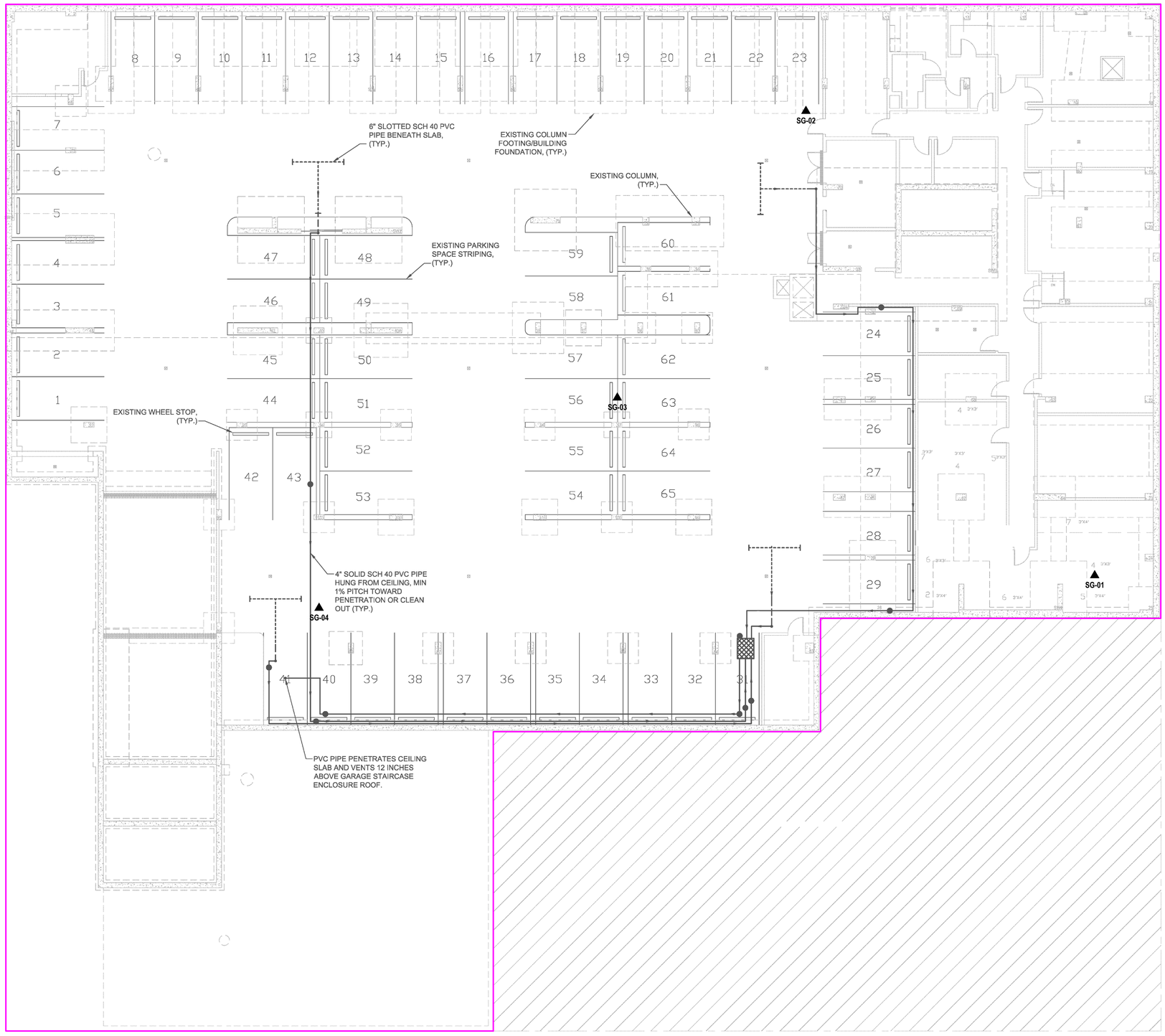
SITE COVER SYSTEM PLAN

DATE
2/4/2022

PROJECT NO.
11259

FIGURE
14

©2022 AKRF, Inc M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\CAD\2021\SMP\11259 Fig 14 Site Cover System Plan.dwg last save: mveilleux 2/4/2022 12:45 PM



LEGEND

- BCP SITE BOUNDARY
- EXISTING CONC. COLUMN
- EXISTING COLUMN FOOTING/FOUNDATION WALL
- EXISTING BUILDING WALL
- EXISTING PARKING STRIPING
- 6" PERFORATED SCH. 40 PVC PIPE BELOW FLOOR SLAB
- 4" SOLID CAST IRON PIPE BELOW FLOOR SLAB
- 4" SOLID SCH. 40 PVC PIPE HUNG FROM CEILING OR WALL
- CLEANOUT
- SUB-SLAB SOIL VAPOR POINT

SOURCE:
BASED ON DRAWINGS A-100 (CELLAR FLOOR CONSTRUCTION PLAN)
AND FS-100 (FOUNDATION PLAN) FROM PROJECT CONSTRUCTION SET
Prepared by YSRAEL A. SEINUK, P.C. CONSULTING ENGINEERS
228 EAST 45th ST, 2nd FLOOR
NEW YORK, NY 10017

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SSDS PLAN

DATE
12/15/2021

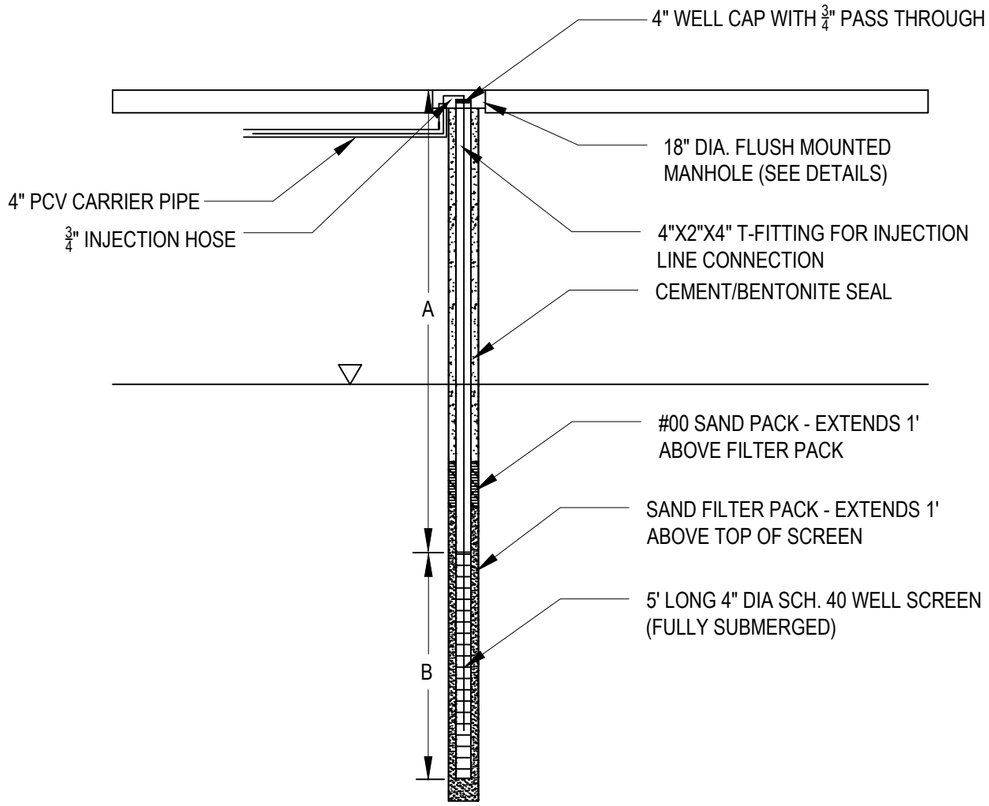
PROJECT NO.
11259

FIGURE
15

\\2021 AKRF, Inc W:\AKRF Projects\Year\11259 - 34 Berry St (LCOR)\BCP\CAD\2021\SSDS\11259 Fig 15 SSDS Plan.dwg last save: mvallejos - 12/15/2021 4:38 PM

DETAIL 1

INJECTION WELL DETAIL

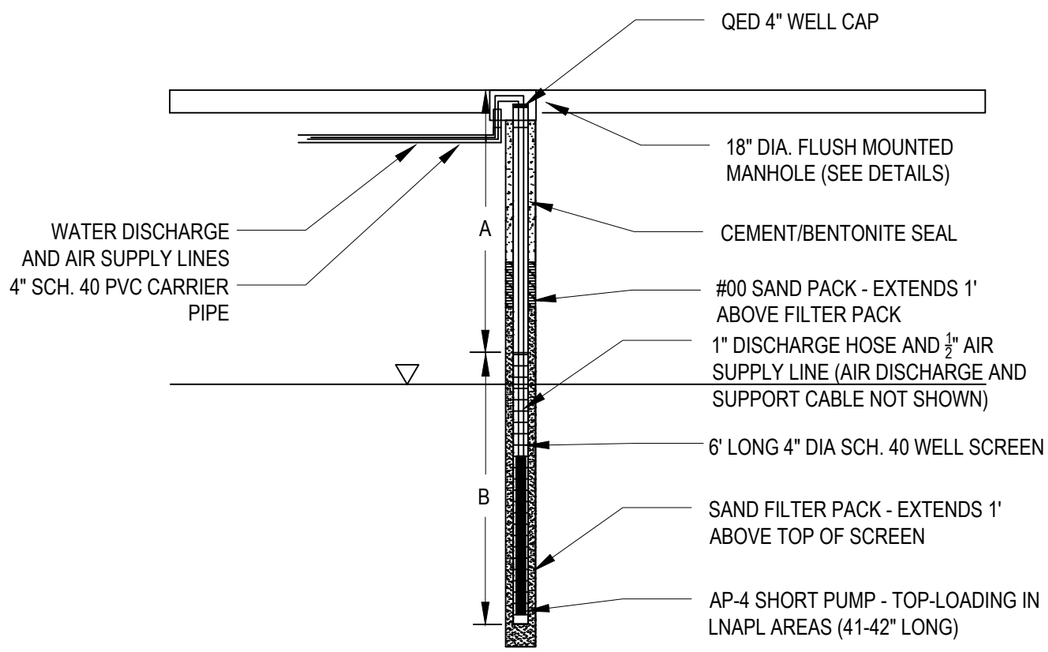


Injection Well	A Casing Length (ft)	B Screen Length (ft)
IW-01	8	5
IW-02	6	10
IW-03	8	5
IW-04	8	5
IW-05*	16	5
IW-06*	16	5
IW-07	8	5

Note: IW-05 and IW-06 were installed in sidewalk, approximately 8 feet above basement slab

DETAIL 2

EXTRACTION WELL



NOTE: AIR DISCHARGE FROM PUMP EXHAUST VENTED IN THE WELL



Extraction Well	A Casing Length (ft)	B Screen Length (ft)
RW-01	5	10
RW-02	4.5	10
RW-03*	13	10

Note: RW-03 were installed in sidewalk, approximately 8 feet above basement slab

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INJECTION AND EXTRACTION WELL CONSTRUCTION DETAILS

DATE
12/13/2021

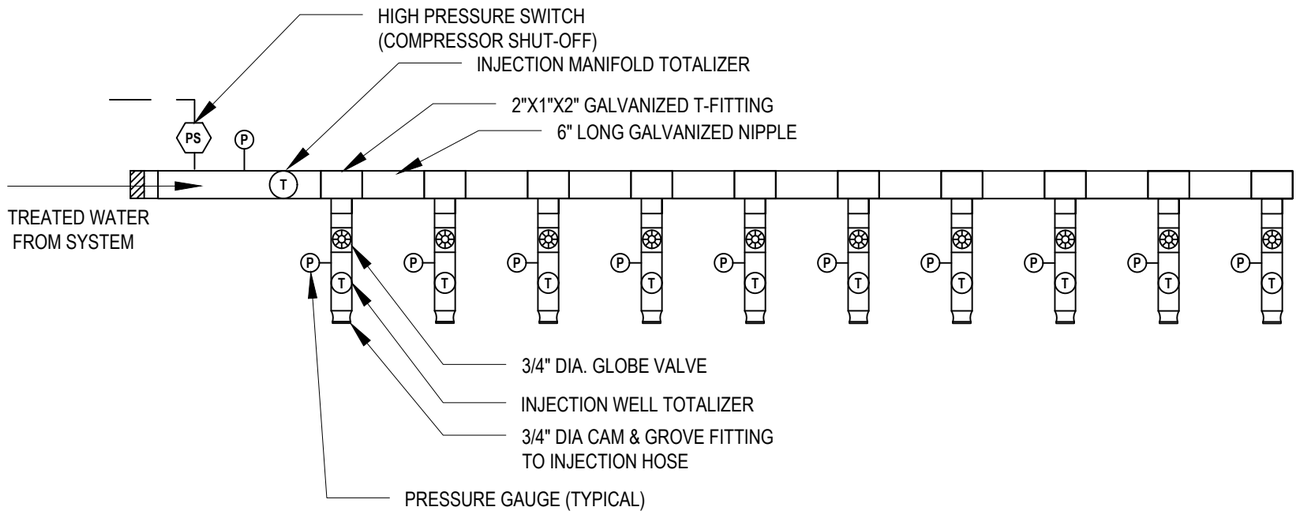
PROJECT NO.
11259

FIGURE
16A

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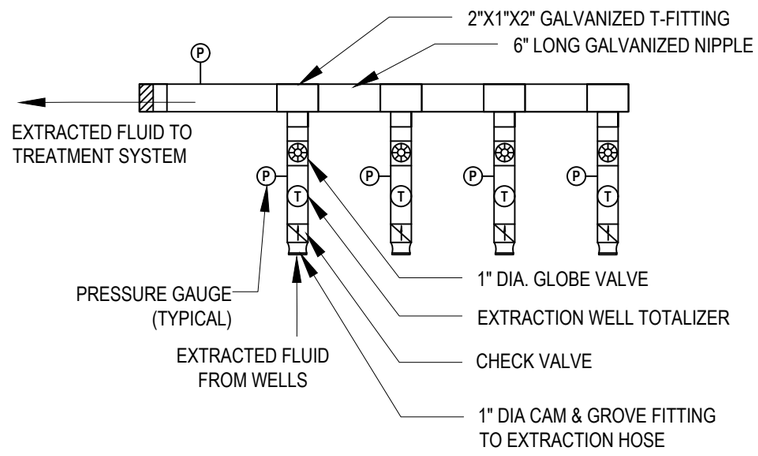
DETAIL 3

INJECTION MANIFOLD DETAIL



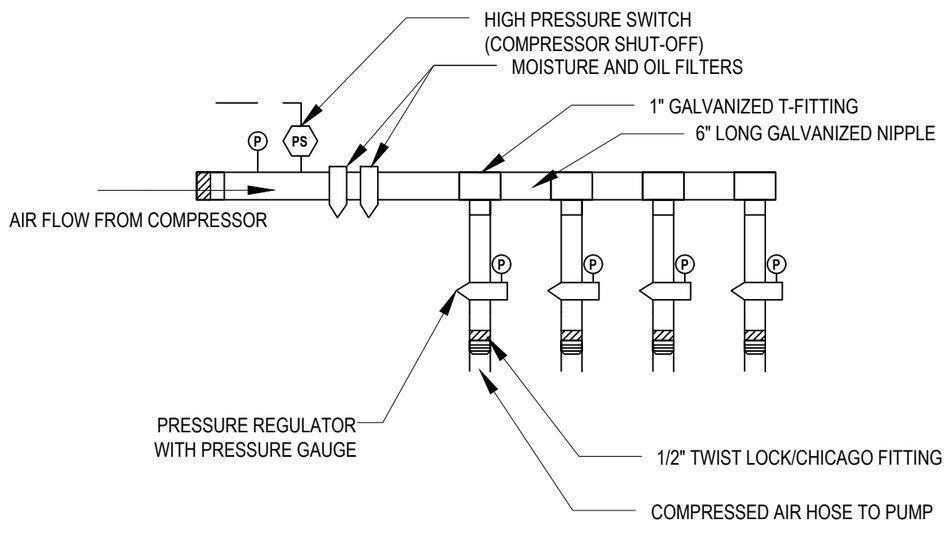
DETAIL 4

EXTRACTION FLUID MANIFOLD DETAIL



DETAIL 5

EXTRACTION AIR DISTRIBUTION MANIFOLD DETAIL





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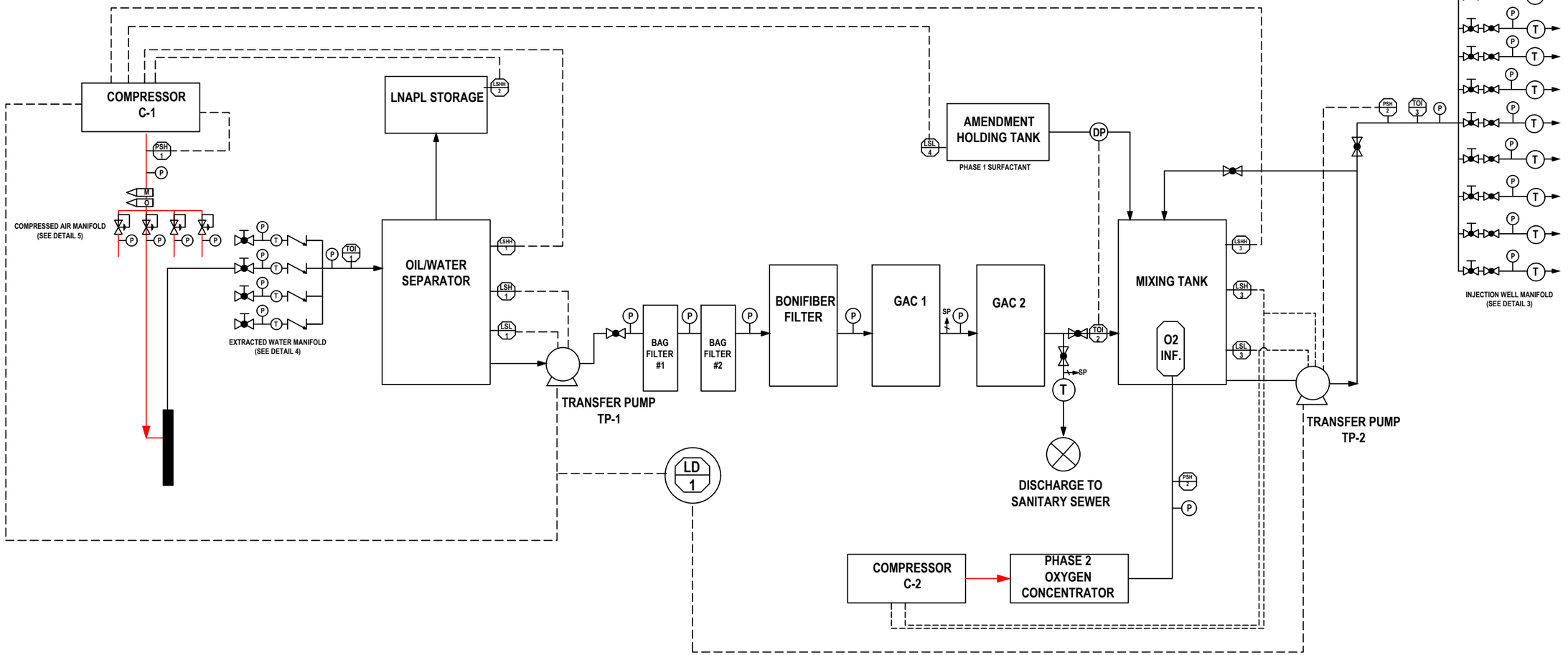
GROUNDWATER TREATMENT SYSTEM AIR AND FLUID MANIFOLD DETAILS

DATE
12/13/2021

PROJECT NO.
11259

FIGURE
16B

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NOTE:
1. PHASE 2 OXYGEN CONCENTRATOR AND ASSOCIATED EQUIPMENT WILL BE INSTALLED UPON TRANSITION FROM PHASE I TO PHASE II GROUNDWATER TREATMENT (ANTICIPATED FEBRUARY 2022)

LEGEND

- PRESSURE GAUGE
- TOTALIZER
- TRANSFER PUMP
- GLOBE VALVE
- SAMPLE PORT
- BALL VALVE
- CHECK VALVE
- TOTALIZER INDICATOR (DIGITAL OUTPUT)
- HIGH PRESSURE SWITCH
- DOSING PUMP
- LEVEL SWITCH
- PRESSURE REGULATOR
- COMPRESSED AIR LINE
- INTERLOCK/SIGNAL LINE
- LEAK DETECTOR
- MOISTURE/OIL FILTER

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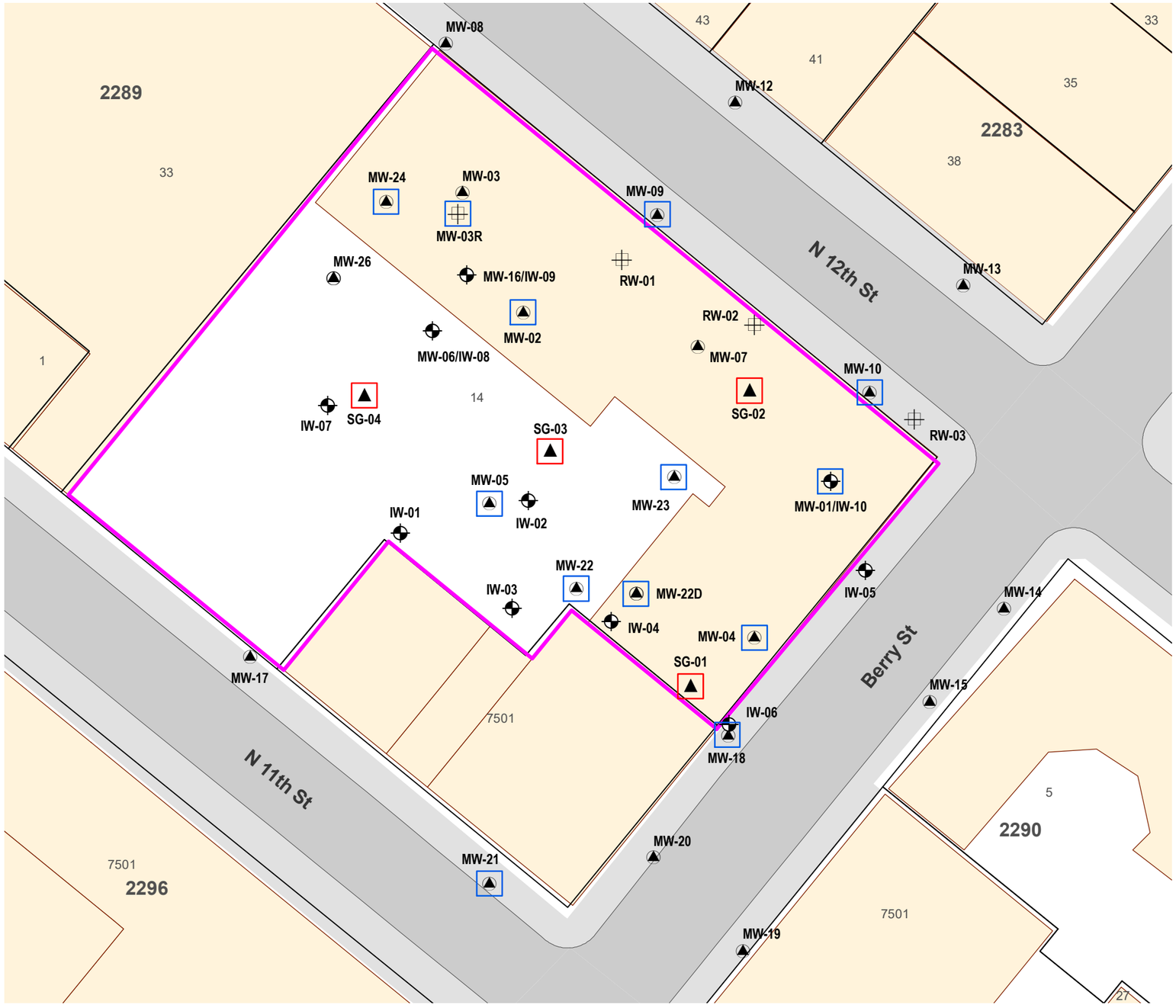
TREATMENT SYSTEM PROCESS AND INSTRUMENTATION DIAGRAM (P&ID)

DATE
12/13/2021

PROJECT NO.
11259

FIGURE
17

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Map Source:
NYCDCP (NYC Dept. of City Planning) GIS database.

LEGEND

- PROJECT SITE BOUNDARY
- 14 LOT BOUNDARY AND TAX LOT NUMBER
- 2289 BLOCK NUMBER
- BUILDING
- INJECTION WELL LOCATION
- EXTRACTION WELL LOCATION
- MONITORING WELL LOCATION
- SUB-SLAB SOIL GAS POINT LOCATION
- SITE MANAGEMENT MONITORING WELL
- SITE MANAGEMENT SUB-SLAB SOIL GAS POINT

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MONITORING LOCATIONS FOR SITE MANAGEMENT

DATE
1/21/2022

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FIGURE
18

©2022 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\GIS\SMP\11259 Fig 18 Monitoring Locations for Site Management.mxd1/21/2022 2:26:19 PM mvelleux

APPENDIX A
ENVIRONMENTAL EASEMENT

ENVIRONMENTAL EASEMENT
CHECKLIST/CERTIFICATION
SITE No. C224268

The following requirements and attachments must be included as part of the submission to the Department for an Environmental Easement. Upon completion of the review, an attorney must sign the checklist indicating that they have fully completed the checklist. The Department will not accept submissions which have not been signed as being accurate and complete by both the Remedial Party and Attorney. Where the property owner is not the Remedial Party, the Department also requires the Owner to sign the checklist.

1) **Special Circumstances**

The last owner search was completed and the deed transfer is by Quit Claim or other restricted transfer deed ☐Yes ☑No

The property in the Brownfield Cleanup Agreement includes lands under water ☐Yes ☑No

The property has multiple owners ☐Yes ☑No

If you answered "Yes" to any of these items, contact the Department's Environmental Easement contact person for a determination as to whether further title work is necessary.

2) **Verification of ownership of the property**

- ☑ Submit documentation (such as a corporate resolution) that the signatory on the easement has authority to sign the Easement
- ☑ Ownership of the property matches the current deed.
- ☑ Verification reviewed and included for authority to sign Easement.
- ☑ Updated copies of legal organizational documents have been reviewed and are included. Examples of the appropriate documentation will include, for:
  - corporations: articles of incorporation, organizational agreements, minutes of annual meetings, resolutions, authorities for signature;
  - partnerships: a copy of the partnership agreement; verification that necessary parties are participating in the Easement;
  - trusts: trust agreement, affidavit of no change in the trust; and
  - estates: estate letters, powers of attorney.

3) **Verification of Property Subject to Easement**

- ☑ Description of the property for the Easement and DEC Agreement/Order/SAC matches description of property in the deed (Separate submittal must be included to explain to the satisfaction of the Department why there is any discrepancy).
- ☑ The Tax Map identifier (SBL) matches on all documents.

4) Survey Review

- ☑ Survey includes metes and bounds description.
- ☑ Survey includes a graphic scale.
- ☑ Survey includes Tax Map Section, Block and Lot.
- ☑ Survey includes physical address and is consistent with the DEC Agreement/Order/SAC.
- ☑ The survey must bear the name, address, telephone number, signature and certification of the professional land surveyor who performed the survey, his or her official seal and registration number, the date the survey was completed, the dates of all of the surveyor's revisions.
- ☑ The survey boundaries must be drawn to a convenient scale, with that scale clearly indicated. A graphic scale, shown in feet and meters, must be included.
- ☑ The symbols and abbreviations that are used on the survey must be identified by the use of a legend.
- ☑ Diagrams must be accurately presented.
- ☑ The point of beginning of the legal description must be shown.
- ☑ The legal description must be correct.
- ☑ The legal description must state the acreage.
- ☑ If the deed(s) description differs from the measured bearings/angles/distances, both must be indicated on the survey.
- ☑ The survey must show the location of all buildings/monuments/overlaps/encroachments upon the surveyed property with their locations defined by measurement perpendicular to the nearest perimeter boundaries.
- ☑ The survey must depict the location of visible improvements within five feet of each side of boundary lines.
- ☑ The survey must show ponds, lakes, springs, rivers or a natural water boundary bordering on or running through the surveyed property; the survey must measure the location of the natural water boundary and note on the survey the date of the measurement.
- ☑ The survey must correctly depict the environmental easement area with corresponding metes & bounds description and acreage, and include the following sentence: "*This property is subject to an environmental easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York Environmental Conservation Law. The engineering and institutional controls for this Easement are set forth in the Site Management Plan (SMP). A copy of the SMP must be obtained by any party with an interest in the property. The SMP can be obtained from NYS Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or at derweb@dec.ny.gov*". This reference must be located on the face of the survey and be in at least 15-point type.
- ☐ If the survey consists of more than one sheet, sheets must be numbered and the total number of sheets must be indicated on each sheet.

☑ In addition to county-specific requirements, submittal of the approved survey to the Department must include the following:

- A "D" sized copy (24" x 36") of the final signed, stamped map
- A 600 DPI scan of the final signed, stamped map
- An Autocad .dwg or exported .dxf file of the polyline (at a minimum) of the final survey

5) Submissions

☑ The Environmental Easement Package being submitted to the Department includes the applicable documents set forth in Attachment A.

PLEASE READ THE FOLLOWING CAREFULLY

The Remedial Party and the Remedial Party's attorney understand and acknowledge that the New York State Department of Environmental Conservation will rely on each and every answer in this statement: (1) to determine whether the Easement Package can be reviewed in a timely fashion; and (2) to determine whether the Easement Package should be approved. The Remedial Party and the Remedial Party's attorney understand and acknowledge that any false statement or misrepresentation herein will constitute cause for the revocation of the Certificate of Completion issued in reliance on this checklist and accompanying documentation. The Remedial Party and the Remedial Party's attorney further acknowledge that the failure to provide the Department with valid and enforceable Environmental Easement on the property may be grounds for the Department to revoke any Certificate of Completion for the site.

Statement of Certification and Signatures

I have reviewed the information being submitted in relation to this Easement Package and this information, to the best of my knowledge and belief, is accurate and correct. I further acknowledge that the failure to provide the Department with valid and enforceable Environmental Easement on the property may be grounds for the Department to revoke any Certificate of Completion for the site.

1) By Remedial Party:
I hereby affirm that information provided on this form and its attachments is true and complete to the best of my knowledge and belief. I further acknowledge that the failure to provide the Department with valid and enforceable Environmental Easement on the property may be grounds for the Department to revoke any Certificate of Completion for the site.

Date: _____ Signature: _____

Print Name:_____

2) By Remedial Party's Attorney:
I hereby affirm that I am the attorney for 34 Berry Street LLC (entity); that I am authorized by that entity to make this certification; that this certification was prepared by me or under my supervision and direction; and that information provided on this form and its attachments is true and complete to the best of my knowledge and belief.

Date: Jan 28, 2022 Signature: _____

Print Name: Andrew B Robb

Attachment

Attachment A

Documents required to be sent in hard copy with electronic formats copied to the Project Manager and Project Attorney for a complete Environmental Easement package:

1) Copy(ies) of current deed(s) and supporting title documentation (see Department Title Requirements).

2) Copy of tax map.

3) Proof of authority to obligate owner of property as set forth in "Verification of ownership of property" on the Easement checklist.

4) Legal description of the easement area, electronic copy to be in an electronic text format (i.e., MS Word or Rich Text Format).

5) One full-sized, signed Survey and an electronic Survey submitted as a fully rendered PDF (not scanned).

6) A draft Notice to Municipality, with appropriate site-specific provisions.

7) Easement Checklist with certification signed by Remedial Party and Remedial Party's attorney.

8) Signed transfer tax forms (TP-584 or ACRIS Forms).

Hard copy submission shall be sent to:

Bradford Burns, Esq.
New York State Department of Environmental Conservation
Office of General Counsel
625 Broadway
Albany, NY 12233-1500

Notice to Municipality of Environmental Easement

Date:

Office of the City Register
City of New York, Kings County
360 Adams Street, Room 189
Brooklyn, NY 1120

Re: Environmental Easement

Dear Sir or Madam:

Attached please find a copy of an environmental easement granted to the New York State Department of Environmental Conservation ("Department")

on _____,
by 34 Berry Street, LLC,
for property at 34 Berry Street, Brooklyn, NY 11249
Tax Map No. Block 2289, Lot 14
DEC Site No:C224268.

This Environmental Easement restricts future use of the above-referenced property to restricted residential uses. Any on-site activity must be done in accordance with the Environmental Easement and the Site Management Plan which is incorporated into the Environmental Easement. This includes maintenance of the cover system, continued operation of the groundwater treatment system, operating and maintaining a sub-slab depressurization system. Department approval is also required prior to any groundwater use.

Article 71, Section 71-3607 of the New York State Environmental Conservation Law requires that:

1. Whenever the department is granted an environmental easement, it shall provide each affected local government with a copy of such easement and shall also provide a copy of any documents modifying or terminating such environmental easement.

2. Whenever an affected local government receives an application for a building permit or any other application affecting land use or development of land that is subject to an environmental easement and that may relate to or impact such easement, the affected local government shall notify the department and refer such application to the department. The department shall evaluate whether the application is consistent with the environmental easement and shall notify the affected local government of its determination in a timely fashion, considering the

time frame for the local government's review of the application. The affected local government shall not approve the application until it receives approval from the department.

An electronic version of every environmental easement that has been accepted by the Department is available to the public at: http://www.dec.ny.gov/chemical/36045.html. Please forward this notice to your building and/or planning departments, as applicable, to ensure your compliance with these provisions of New York State Environmental Conservation Law. If you have any questions or comments regarding this matter, please do not hesitate to contact me.

Very truly yours,

Dano 8pm

OWNER'S POLICY OF TITLE INSURANCE

Issued by **Commonwealth Land Title Insurance Company**

POLICY NUMBER

C30-0045679

LandAmerica Commonwealth

Commonwealth Land Title Insurance Company is a member of the LandAmerica family of title insurance underwriters.

Any notice of claim and any other notice or statement in writing required to be given to the Company under this Policy must be given to the Company at the address shown in Section 18 of the Conditions.

COVERED RISKS

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE EXCEPTIONS FROM COVERAGE CONTAINED IN SCHEDULE B, AND THE CONDITIONS, COMMONWEALTH LAND TITLE INSURANCE COMPANY, a Nebraska corporation (the "Company") insures, as of Date of Policy and, to the extent stated in Covered Risks 9 and 10, after Date of Policy, against loss or damage, not exceeding the Amount of Insurance, sustained or incurred by the Insured by reason of:

1. Title being vested other than as stated in Schedule A.
2. Any defect in or lien or encumbrance on the Title. This Covered Risk includes but is not limited to insurance against loss from
   (a) A defect in the Title caused by
      (i) forgery, fraud, undue influence, duress, incompetency, incapacity, or impersonation;
      (ii) failure of any person or Entity to have authorized a transfer or conveyance;
      (iii) a document affecting Title not properly created, executed, witnessed, sealed, acknowledged, notarized, or delivered;
      (iv) failure to perform those acts necessary to create a document by electronic means authorized by law;
      (v) a document executed under a falsified, expired, or otherwise invalid power of attorney;
      (vi) a document not properly filed, recorded, or indexed in the Public Records including failure to perform those acts by electronic means authorized by law; or
      (vii) a defective judicial or administrative proceeding.
   (b) The lien of real estate taxes or assessments imposed on the Title by a governmental authority due or payable, but unpaid.
   (c) Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land. The term "encroachment" includes encroachments of existing improvements located on the Land onto adjoining land, and encroachments onto the Land of existing improvements located on adjoining land.
3. Unmarketable Title.
4. No right of access to and from the Land.
5. The violation or enforcement of any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (a) the occupancy, use, or enjoyment of the Land;
   (b) the character, dimensions, or location of any improvement erected on the Land;
   (c) the subdivision of land; or
   (d) environmental protection

   if a notice, describing any part of the Land, is recorded in the Public Records setting forth the violation or intention to enforce, but only to the extent of the violation or enforcement referred to in that notice.
6. An enforcement action based on the exercise of a governmental police power not covered by Covered Risk 5 if a notice of the enforcement action, describing any part of the Land, is recorded in the Public Records, but only to the extent of the enforcement referred to in that notice.
7. The exercise of the rights of eminent domain if a notice of the exercise, describing any part of the Land, is recorded in the Public Records.
8. Any taking by a governmental body that has occurred and is binding on the rights of a purchaser for value without Knowledge.
9. Title being vested other than as stated in Schedule A or being defective
   (a) as a result of the avoidance in whole or in part, or from a court order providing an alternative remedy, of a transfer of all or any part of the title to or any interest in the Land occurring prior to the transaction vesting Title as shown in Schedule A because that prior transfer constituted a fraudulent or preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws; or
   (b) because the instrument of transfer vesting Title as shown in Schedule A constitutes a preferential transfer under federal bankruptcy, state insolvency, or similar creditors' rights laws by reason of the failure of its recording in the Public Records
      (i) to be timely, or
      (ii) to impart notice of its existence to a purchaser for value or to a judgment or lien creditor.
10. Any defect in or lien or encumbrance on the Title or other matter included in Covered Risks 1 through 9 that has been created or attached or has been filed or recorded in the Public Records subsequent to Date of Policy and prior to the recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The Company will also pay the costs, attorneys' fees, and expenses incurred in defense of any matter insured against by this Policy, but only to the extent provided in the Conditions.

IN WITNESS WHEREOF, the Company has caused this Policy to be signed with the facsimile signatures of its President and Secretary and sealed as required by its By-Laws.

COMMONWEALTH LAND TITLE INSURANCE COMPANY

Attest: _____ Secretary

COMMONWEALTH LAND TITLE INSURANCE COMPANY SEAL NEBRASKA

By: _____ President

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to
   (i) the occupancy, use, or enjoyment of the Land;
   (ii) the character, dimensions, or location of any improvement erected on the Land;
   (iii) the subdivision of land; or
   (iv) environmental protection;
   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.
   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters
   (a) created, suffered, assumed, or agreed to by the Insured Claimant;
   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
   (c) resulting in no loss or damage to the Insured Claimant;
   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 and 10; or
   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is
   (a) a fraudulent conveyance or fraudulent transfer; or
   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

CONDITIONS

1 DEFINITION OF TERMS

The following terms when used in this policy mean:

(a) "Amount of Insurance": The amount stated in Schedule A, as may be increased or decreased by endorsement to this policy, increased by Section 8(b), or decreased by Sections 11 and 12 of these Conditions.

(b) "Date of Policy": The date designated as "Date of Policy" in Schedule A.

(c) "Entity": A corporation, partnership, trust, limited liability company, or other similar legal entity.

(d) "Insured": The Insured named in Schedule A.

(i) The term "Insured" also includes

(A) successors to the Title of the Insured by operation of law as distinguished from purchase, including heirs, devisees, survivors, personal representatives, or next of kin;

(B) successors to an Insured by dissolution, merger, consolidation, distribution, or reorganization;

(C) successors to an Insured by its conversion to another kind of Entity;

(D) a grantee of an Insured under a deed delivered without payment of actual valuable consideration conveying the Title

(1) if the stock, shares, memberships, or other equity interests of the grantee are wholly-owned by the named Insured,

(2) if the grantee wholly owns the named Insured,

(3) if the grantee is wholly-owned by an affiliated Entity of the named Insured, provided the affiliated Entity and the named Insured are both wholly-owned by the same person or Entity, or

(4) if the grantee is a trustee or beneficiary of a trust created by a written instrument established by the Insured named in Schedule A for estate planning purposes.

(ii) With regard to (A), (B), (C), and (D) reserving, however, all rights and defenses as to any successor that the Company would have had against any predecessor Insured.

(e) "Insured Claimant": An Insured claiming loss or damage.

(f) "Knowledge" or "Known": Actual knowledge, not constructive knowledge or notice that may be imputed to an Insured by reason of the Public Records or any other records that impart constructive notice of matters affecting the Title.

(g) "Land": The land described in Schedule A, and affixed improvements that by law constitute real property. The term "Land" does not include any property beyond the lines of the area described in Schedule A, nor any right, title, interest, estate, or easement in abutting streets, roads, avenues, alleys, lanes, ways, or waterways, but this does not modify or limit the extent that a right of access to and from the Land is insured by this policy.

(h) "Mortgage": Mortgage, deed of trust, trust deed, or other security instrument, including one evidenced by electronic means authorized by law.

(i) "Public Records": Records established under state statutes at Date of Policy for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without Knowledge. With respect to Covered Risk 5(d), "Public Records" shall also include environmental protection liens filed in the records of the clerk of the United States District Court for the district where the Land is located.

(j) "Title": The estate or interest described in Schedule A.

(k) "Unmarketable Title": Title affected by an alleged or apparent matter that would permit a prospective purchaser or lessee of the Title or lender on the Title to be released from the obligation to purchase, lease, or lend if there is a contractual condition requiring the delivery of marketable title.

2. CONTINUATION OF INSURANCE

The coverage of this policy shall continue in force as of Date of Policy in favor of an Insured, but only so long as the Insured retains an estate or interest in the Land, or holds an obligation secured by a purchase money Mortgage given by a purchaser from the Insured, or only so long as the Insured shall have liability by reason of warranties in any transfer or conveyance of the Title. This policy shall not continue in force in favor of any purchaser from the Insured of either (i) an estate or interest in the Land, or (ii) an obligation secured by a purchase money Mortgage given to the Insured.

3. NOTICE OF CLAIM TO BE GIVEN BY INSURED CLAIMANT

The Insured shall notify the Company promptly in writing (i) in case of any litigation as set forth in Section 5(a) of these Conditions, (ii) in case Knowledge shall come to an Insured hereunder of any claim of title or interest that is adverse to the Title, as insured, and that might cause loss or damage for which the Company may be liable

Title No.: 07NYK11029
Policy No.: C30-0045679

SCHEDULE A

Amount of Insurance:	**$15,800,000.00**	**Policy No.: C30-0045679**
Date of Policy:	**December 21, 2007**	**File No.: 07NYK11029**

Name of Insured: **34 BERRY STREET LLC**

1. **The estate or interest in the land that is covered by this policy is:**

   Fee Simple

2. **Title to the estate or interest in the land is vested in:**

   34 Berry Street LLC, which acquired title from Robert Sharon, Adrienne Sharon, Adam Sharon, Greg Sharon and Scott Sharon by Deed dated as of December 21, 2007, and to be duly recorded in the Office of the New York City Register, Kings County.

3. **The land referred to in this policy is described in said instruments, is situated in the County of Kings and State of New York, and is identified as follows:**

   SEE SCHEDULE A DESCRIPTION HEREIN

Countersigned:

New York Land Services,
A LandAmerica Company
630 Third Avenue, 12th Floor
New York, NY 10017
Tel: (212) 490-2277
Fax: (212) 490-8012

Title No.: 07NYK11029
Policy No.: C30-0045679

SCHEDULE A
DESCRIPTION

ALL that certain plot, piece or parcel of land situate, lying and being in the County of Kings, City and State of New York, described as follows:

BEGINNING at a corner formed by the northwesterly side of Berry Street with the southwesterly side of North 12th Street;

RUNNING THENCE northwesterly along the westerly side of North 12th Street 225 feet;

THENCE southwesterly parallel with Berry Street, 200 feet to the northeasterly side of North 11th Street;

THENCE southeasterly along the southwesterly side of North 11th Street 95 feet to the center of a party wall;

THENCE northeasterly parallel with Berry Street and through the center of a party wall, 58 feet 5-1/4 inches;

THENCE southeasterly parallel with North 11th Street, 63 feet 8-1/2 inches;

THENCE northeasterly parallel with Berry Street, 22 feet ½ inch;

THENCE southeasterly parallel with North 11th Street, 66 feet 3-1/2 inches to the northwesterly side of Berry Street;

THENCE northeasterly along the northwesterly side of Berry Street approximately 119 feet 9 inches to the point or place of BEGINNING.

END OF SCHEDULE A

Title No.: 07NYK11029
Policy No.: C30-0045679

SCHEDULE B
EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay cost, attorney's fees or expenses) which arise by reason of:

1. Survey exceptions set forth in the Survey Reading herein.

END OF SCHEDULE B

Title No.: 07NYK11029
Policy No.: C30-0045679

SURVEY READING

Survey made by True North Surveyors, Inc. dated October 2006 and updated on December 12, 2007 shows a 1-story brick, 2-story brick and concrete block, 4-story brick, asphalt and the following survey exceptions:

1. Fence encroaches 0.13 feet north onto North 12th Street.

2. Edge of concrete encroaches 0.17 feet north onto North 12th Street.

3. Northerly wall of 1-story brick encroaches up to 0.33 feet north onto North 12th Street.

4. Northerly wall of 2-story brick and concrete block encroaches 0.02 feet north onto North 12th Street.

5. Steel columns support roof of 2-story brick and concrete block; no wall along portion of westerly record line.

6. Chimney of 4-story brick adjoining on the south projects an undetermined distance onto subject premises.

7. Northerly wall of 6-story brick adjoining on the south encroaches 0.40 feet west and 0.03 feet north onto subject premises.

8. Variations between chain link fence on concrete curb and easterly record line (said fence and curb are located up to 0.43 feet west of said easterly record line and up to 0.10 feet east of said easterly record line.)

END OF SURVEY READING

Title No.: 07NYK11029
Policy No.: C30-0045679

COMMONWEALTH LAND TITLE INSURANCE COMPANY

STANDARD NEW YORK ENDORSEMENT

(OWNER'S POLICY)

Attached to and made a part of Policy Number C30-0045679

1. Covered Risk Number 2(c) is deleted.

2. The following is added as a Covered Risk:

   "11. Any statutory lien for services, labor or materials furnished prior to the date hereof, and which has now gained or which may hereafter gain priority over the estate or interest of the insured as shown in Schedule A of this policy."

3. Exclusion Number 5 is deleted, and the following is substituted:

   5. Any lien on the Title for real estate taxes, assessments, water charges or sewer rents imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as Shown in Schedule A.

This endorsement is issued as part of the policy. Except as it expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsements, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance. To the extent a provision of the policy or a previous endorsement is inconsistent with an express provision of this endorsement, this endorsement controls. Otherwise, this endorsement is subject to all of the terms and provisions of the policy and of any prior endorsements.

DATED: December 21, 2007

Countersigned:

New York Land Services,
A LandAmerica Company

Title No.: 07NYK11029
Policy No.: C30-0045679

COMMONWEALTH LAND TITLE INSURANCE COMPANY

LAND SAME AS SURVEY ENDORSEMENT

Attached to and made a part of Policy Number C30-0045679

The Company hereby assures the Insured that said land as described in Schedule A is the same as that delineated on the plat of Survey made by True North Surveyors, Inc. dated October 2006 and updated on December 12, 2007.

The Company hereby insures said Assured against loss which said Assured shall sustain in the event said assurances herein shall prove to be incorrect.

The total liability of the Company under said policy and any endorsement therein shall not exceed, in the aggregate, the face amount of said policy and costs which the Company is obligated under the Conditions and Stipulations thereof to pay.

This endorsement is made a part of the policy and is subject to all of the terms and provisions thereof and of any prior endorsements thereto. Except to the extent expressly stated, it neither modifies any of the terms and provisions of the policy and any prior endorsements, nor does it extend the effective date of the policy and any prior endorsements, nor does it increase the face amount thereof.

DATED: December 21, 2007

Countersigned:

New York Land Services,
A LandAmerica Company

TIRSA LAND SAME AS SURVEY ENDORSEMENT (5-1-07)

by virtue of this policy, or (iii) if the Title, as insured, is rejected as Unmarketable Title. If the Company is prejudiced by the failure of the Insured Claimant to provide prompt notice, the Company's liability to the Insured Claimant under the policy shall be reduced to the extent of the prejudice.

4. PROOF OF LOSS

In the event the Company is unable to determine the amount of loss or damage, the Company may, at its option, require as a condition of payment that the Insured Claimant furnish a signed proof of loss. The proof of loss must describe the defect, lien, encumbrance, or other matter insured against by this policy that constitutes the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage.

5. DEFENSE AND PROSECUTION OF ACTIONS

(a) Upon written request by the Insured, and subject to the options contained in Section 7 of these Conditions, the Company, at its own cost and without unreasonable delay, shall provide for the defense of an Insured in litigation in which any third party asserts a claim covered by this policy adverse to the Insured. This obligation is limited to only those stated causes of action alleging matters insured against by this policy. The Company shall have the right to select counsel of its choice (subject to the right of the Insured to object for reasonable cause) to represent the Insured as to those stated causes of action. It shall not be liable for and will not pay the fees of any other counsel. The Company will not pay any fees, costs, or expenses incurred by the Insured in the defense of those causes of action that allege matters not insured against by this policy.

(b) The Company shall have the right, in addition to the options contained in Section 7 of these Conditions, at its own cost, to institute and prosecute any action or proceeding or to do any other act that in its opinion may be necessary or desirable to establish the Title, as insured, or to prevent or reduce loss or damage to the Insured. The Company may take any appropriate action under the terms of this policy, whether or not it shall be liable to the Insured. The exercise of these rights shall not be an admission of liability or waiver of any provision of this policy. If the Company exercises its rights under this subsection, it must do so diligently.

(c) Whenever the Company brings an action or asserts a defense as required or permitted by this policy, the Company may pursue the litigation to a final determination by a court of competent jurisdiction, and it expressly reserves the right, in its sole discretion, to appeal any adverse judgment or order.

6. DUTY OF INSURED CLAIMANT TO COOPERATE

(a) In all cases where this policy permits or requires the Company to prosecute or provide for the defense of any action or proceeding and any appeals, the Insured shall secure to the Company the right to so prosecute or provide defense in the action or proceeding, including the right to use, at its option, the name of the Insured for this purpose. Whenever requested by the Company, the Insured, at the Company's expense, shall give the Company all reasonable aid (i) in securing evidence, obtaining witnesses, prosecuting or defending the action or proceeding, or effecting settlement, and (ii) in any other lawful act that in the opinion of the Company may be necessary or desirable to establish the Title or any other matter as insured. If the Company is prejudiced by the failure of the Insured to furnish the required cooperation, the Company's obligations to the Insured under the policy shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation, with regard to the matter or matters requiring such cooperation.

(b) The Company may reasonably require the Insured Claimant to submit to examination under oath by any authorized representative of the Company and to produce for examination, inspection, and copying, at such reasonable times and places as may be designated by the authorized representative of the Company, all records, in whatever medium maintained, including books, ledgers, checks, memoranda, correspondence, reports, e-mails, disks, tapes, and videos whether bearing a date before or after Date of Policy, that reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Insured Claimant shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect, and copy all of these records in the custody or control of a third party that reasonably pertain to the loss or damage. All information designated as confidential by the Insured Claimant provided to the Company pursuant to this Section shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Insured Claimant to submit for examination under oath, produce any reasonably requested information, or grant permission to secure reasonably necessary information from third parties as required in this subsection, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this policy as to that claim.

7. OPTIONS TO PAY OR OTHERWISE SETTLE CLAIMS; TERMINATION OF LIABILITY

In case of a claim under this policy, the Company shall have the following additional options:

(a) To Pay or Tender Payment of the Amount of Insurance.

To pay or tender payment of the Amount of Insurance under this policy together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment or tender of payment and that the Company is obligated to pay.

Upon the exercise by the Company of this option, all liability and obligations of the Company to the Insured under this policy, other than to make the payment required in this subsection, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

(b) To Pay or Otherwise Settle With Parties Other Than the Insured or With the Insured Claimant.

(i) To pay or otherwise settle with other parties for or in the name of an Insured Claimant any claim insured against under this policy. In addition, the Company will pay any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay; or

(ii) To pay or otherwise settle with the Insured Claimant the loss or damage provided for under this policy, together with any costs, attorneys' fees, and expenses incurred by the Insured Claimant that were authorized by the Company up to the time of payment and that the Company is obligated to pay.

Upon the exercise by the Company of either of the options provided for in subsections (b)(i) or (ii), the Company's obligations to the Insured under this policy for the claimed loss or damage, other than the payments required to be made, shall terminate, including any liability or obligation to defend, prosecute, or continue any litigation.

8. DETERMINATION AND EXTENT OF LIABILITY

This policy is a contract of indemnity against actual monetary loss or damage sustained or incurred by the Insured Claimant who has suffered loss or damage by reason of matters insured against by this policy.

(a) The extent of liability of the Company for loss or damage under this policy shall not exceed the lesser of

(i) the Amount of Insurance; or

(ii) the difference between the value of the Title as insured and the value of the Title subject to the risk insured against by this policy.

(b) If the Company pursues its rights under Section 5 of these Conditions and is unsuccessful in establishing the Title, as insured,

(i) the Amount of Insurance shall be increased by 10%, and

(ii) the Insured Claimant shall have the right to have the loss or damage determined either as of the date the claim was made by the Insured Claimant or as of the date it is settled and paid.

(c) In addition to the extent of liability under (a) and (b), the Company will also pay those costs, attorneys' fees, and expenses incurred in accordance with Sections 5 and 7 of these Conditions.

9. LIMITATION OF LIABILITY

(a) If the Company establishes the Title, or removes the alleged defect, lien, or encumbrance, or cures the lack of a right of access to or from the Land, or cures the claim of Unmarketable Title, all as insured, in a reasonably diligent manner by any method, including litigation and the completion of any appeals, it shall have fully performed its obligations with respect to that matter and shall not be liable for any loss or damage caused to the Insured.

(b) In the event of any litigation, including litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals, adverse to the Title, as insured.

(c) The Company shall not be liable for loss or damage to the Insured for liability voluntarily assumed by the Insured in settling any claim or suit without the prior written consent of the Company.

10. REDUCTION OF INSURANCE; REDUCTION OR TERMINATION OF LIABILITY

All payments under this policy, except payments made for costs, attorneys' fees, and expenses, shall reduce the Amount of Insurance by the amount of the payment.

11. LIABILITY NONCUMULATIVE

The Amount of Insurance shall be reduced by any amount the Company pays under any policy insuring a Mortgage to which exception is taken in Schedule B or to which the Insured has agreed, assumed, or taken subject, or which is executed by an Insured after Date of Policy and which is a charge or lien on the Title, and the amount so paid shall be deemed a payment to the Insured under this policy.

12. PAYMENT OF LOSS

When liability and the extent of loss or damage have been definitely fixed in accordance with these Conditions, the payment shall be made within 30 days.

13. RIGHTS OF RECOVERY UPON PAYMENT OR SETTLEMENT

(a) Whenever the Company shall have settled and paid a claim under this policy, it shall be subrogated and entitled to the rights of the Insured Claimant in the Title and all other rights and remedies in respect to the claim that the Insured Claimant has against any person or property, to the extent of the amount of any loss, costs, attorneys' fees, and expenses paid by the Company. If requested by the Company, the Insured Claimant shall execute documents to evidence the transfer to the Company of these rights and remedies. The Insured Claimant shall permit the Company to sue, compromise, or settle in the name of the Insured Claimant and to use the name of the Insured Claimant in any transaction or litigation involving these rights and remedies.

If a payment on account of a claim does not fully cover the loss of the Insured Claimant, the Company shall defer the exercise of its right to recover until after the Insured Claimant shall have recovered its loss.

(b) The Company's right of subrogation includes the rights of the Insured to indemnities, guaranties, other policies of insurance, or bonds, notwithstanding any terms or conditions contained in those instruments that address subrogation rights.

14. ARBITRATION

Either the Company or the Insured may demand that the claim or controversy shall be submitted to arbitration pursuant to the Title Insurance Arbitration Rules of the American Land Title Association ("Rules"). Except as provided in the Rules, there shall be no joinder or consolidation with claims or controversies of other persons.

Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the Insured arising out of or relating to this policy, any service in connection with its issuance or the breach of a policy provision, or to any other controversy or claim arising out of the transaction giving rise to this policy. All arbitrable matters when the Amount of Insurance is $2,000,000 or less shall be arbitrated at the option of either the Company or the Insured. All arbitrable matters when the Amount of Insurance is in excess of $2,000,000 shall be arbitrated only when agreed to by both the Company and the Insured. Arbitration pursuant to this policy and under the Rules shall be binding upon the parties. Judgment upon the award rendered by the Arbitrator(s) may be entered in any court of competent jurisdiction.

15. LIABILITY LIMITED TO THIS POLICY; POLICY ENTIRE CONTRACT

(a) This policy together with all endorsements, if any, attached to it by the Company is the entire policy and contract between the Insured and the Company. In interpreting any provision of this policy, this policy shall be construed as a whole.

(b) Any claim of loss or damage that arises out of the status of the Title or by any action asserting such claim shall be restricted to this policy.

(c) Any amendment of or endorsement to this policy must be in writing and authenticated by an authorized person, or expressly incorporated by Schedule A of this policy.

(d) Each endorsement to this policy issued at any time is made a part of this policy and is subject to all of its terms and provisions. Except as the endorsement expressly states, it does not (i) modify any of the terms and provisions of the policy, (ii) modify any prior endorsement, (iii) extend the Date of Policy, or (iv) increase the Amount of Insurance.

16. SEVERABILITY

In the event any provision of this policy, in whole or in part, is held invalid or unenforceable under applicable law, the policy shall be deemed not to include that provision or such part held to be invalid, but all other provisions shall remain in full force and effect.

17. CHOICE OF LAW; FORUM

(a) Choice of Law: The Insured acknowledges the Company has underwritten the risks covered by this policy and determined the premium charged therefor in reliance upon the law affecting interests in real property and applicable to the interpretation, rights, remedies, or enforcement of policies of title insurance of the jurisdiction where the Land is located.

Therefore, the court or an arbitrator shall apply the law of the jurisdiction where the Land is located to determine the validity of claims against the Title that are adverse to the Insured and to interpret and enforce the terms of this policy. In neither case shall the court or arbitrator apply its conflicts of law principles to determine the applicable law.

(b) Choice of Forum: Any litigation or other proceeding brought by the Insured against the Company must be filed only in a state or federal court within the United States of America or its territories having appropriate jurisdiction.

18. NOTICES, WHERE SENT

Any notice of claim and any other notice or statement in writing required to be given to the Company under this Policy must be given to the Company at: Consumer Affairs Department PO Box 27567 Richmond, Virginia 23261-7567

THANK YOU.

Title insurance provides for the protection of your real estate investment. We suggest you keep this policy in a safe place where it can be readily available for future reference.

If you have questions about title insurance or the coverage provided by this policy, contact the office that issued this policy, or you may call or write:

Commonwealth Land Title Insurance Company
Consumer Affairs
P.O. Box 27567
Richmond, Virginia 23261-7567
telephone, toll free: 800 446-7086
web: www.landam.com

We thank you for choosing to do business with Commonwealth Land Title Insurance Company, and look forward to meeting your future title insurance needs.

Commonwealth Land Title Insurance Company is a member of the LandAmerica family of title insurance underwriters.

LandAmerica Commonwealth

TP-584-NYC (9/19)

Department of Taxation and Finance

Combined Real Estate Transfer Tax Return, Credit Line Mortgage Certificate, and Certification of Exemption from the Payment of Estimated Personal Income Tax for the Conveyance of Real Property Located in New York City

Recording office time stamp

See Form TP-584-NYC-I, Instructions for Form TP-584-NYC, *before completing this form. Print or type.*

Schedule A – Information relating to conveyance

Grantor/Transferor

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Multi-member LLC
☒ Other

Name *(if individual, last, first, middle initial)* (☐ *mark an X if more than one grantor)*: 34 Berry Street LLC

Social Security number (SSN):

Mailing address: 850 Cassatt Road

SSN:

City: Berwyn | State: PA | ZIP code: 19312

Employer identification number (EIN): 26-1608566

Single member's name if grantor is a single member LLC *(see instructions)*:

Single member EIN or SSN:

Grantee/Transferee

☐ Individual
☐ Corporation
☐ Partnership
☐ Estate/Trust
☐ Single member LLC
☐ Multi-member LLC
☐ Other

Name *(if individual, last, first, middle initial)* (☐ *mark an X if more than one grantee)*: State of New York

SSN:

Mailing address:

SSN:

City: | State: | ZIP code:

EIN:

Single member's name if grantee is a single member LLC *(see instructions)*:

Single member EIN or SSN:

Location and description of property conveyed

Tax map designation – Section, block & lot *(include dots and dashes)*	SWIS code (six digits)	Street address	City, town, or village	County
3-02289-0014	610100	34 Berry St	Brooklyn	Kings

Type of property conveyed *(mark an X in applicable box)*

1 ☐ One- to three-family house
2 ☐ Residential cooperative
3 ☐ Residential condominium
4 ☐ Vacant land
5 ☐ Commercial/Industrial
6 ☐ Apartment building
7 ☐ Office building
8 ☐ Four-family dwelling
9 ☐ Other _____

Date of conveyance: ____ / ____ / ____ (month / day / year)

☐ Contract executed on or before April 1, 2019 *(see instructions)*

Percentage of real property conveyed which is residential real property _____ % *(see instructions)*

Condition of conveyance *(mark all that apply)*

a. ☐ Conveyance of fee interest
b. ☐ Acquisition of a controlling interest (state percentage acquired _____ %)
c. ☐ Transfer of a controlling interest (state percentage transferred _____ %)
d. ☐ Conveyance to cooperative housing corporation
e. ☐ Conveyance pursuant to or in lieu of foreclosure or enforcement of security interest *(attach Form TP-584.1, Schedule E)*
f. ☐ Conveyance which consists of a mere change of identity or form of ownership or organization *(attach Form TP-584.1, Schedule F)*
g. ☐ Conveyance for which credit for tax previously paid will be claimed *(attach Form TP-584.1, Schedule G)*
h. ☐ Conveyance of cooperative apartment(s)
i. ☐ Syndication
j. ☐ Conveyance of air rights or development rights
k. ☐ Contract assignment
l. ☐ Option assignment or surrender
m. ☐ Leasehold assignment or surrender
n. ☐ Leasehold grant
o. ☒ Conveyance of an easement
p. ☐ Conveyance for which exemption from transfer tax claimed *(complete Schedule B, Part 4)*
q. ☐ Conveyance of property partly within and partly outside the state
r. ☐ Conveyance pursuant to divorce or separation
s. ☐ Other *(describe)* _____

For recording officer's use	Amount received	Date received	Transaction number
	Schedule B, Part 1 $ _____		
	Schedule B, Part 2 $ _____		
	Schedule B, Part 3 $ _____		

Schedule B – Real estate transfer tax return (Tax Law Article 31)

Part 1 – Computation of tax due *(in addition to the tax on line 4, you must compute the tax on lines 5a and 5b, if applicable)*

1	Enter amount of consideration for the conveyance *(if you are claiming a total exemption from tax, mark an X in the Exemption claimed box, enter consideration and proceed to Part 4)* ☒ **Exemption claimed**	1.	
2	Continuing lien deduction *(see instructions if property is taken subject to mortgage or lien)*	2.	
3	Taxable consideration *(subtract line 2 from line 1)*	3.	
4	Tax: $2 for each $500, or fractional part thereof, of consideration on line 3	4.	
5a	Tax: $1.25 for each $500, or fractional part thereof, of consideration for the conveyance of residential real property located in New York City if the amount on line 3 is $3 million or more *(see instructions)*	5a.	
5b	Tax: $1.25 for each $500, or fractional part thereof, of consideration for the conveyance of property located in New York City other than residential real property, if the amount on line 1 is $2 million or more *(see instructions)*	5b.	
6	Total before credit(s) claimed *(add lines 4, 5a, and 5b)*	6.	
7	Amount of credit claimed for tax previously paid *(see instructions and attach Form TP-584.1, Schedule G)*	7.	
8	Total tax due* *(subtract line 7 from line 6)*	8.	

Part 2 – Computation of additional tax due on the conveyance of residential real property for $1 million or more *(see instructions)*

1	Enter amount of consideration for conveyance *(from Part 1, line 1)*	1.	
2	Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in Schedule A)*	2.	
3	Total additional transfer tax due* *(multiply line 2 by 1% (.01))*	3.	

Part 3 – Computation of supplemental tax due on the conveyance of residential real property, or interest therein, located in New York City, for $2 million or more *(see instructions)*

1	Enter amount of consideration for conveyance *(from Part 1, line 1)*	1.	
2	Taxable consideration *(multiply line 1 by the percentage of the premises which is residential real property, as shown in Schedule A)*	2.	
3	Total supplemental transfer tax due* *(multiply line 2 by tax rate, see instruction for rates)*	3.	

*** The total tax (from Part 1, line 8; Part 2, line 3; and Part 3, line 3 above) is due within 15 days from the date of conveyance.**

Part 4 – Explanation of exemption claimed on Part 1, line 1 *(mark an X in any boxes that apply)*

The conveyance of real property is exempt from the real estate transfer tax for the following reason:

a. Conveyance is to the United Nations, the United States of America, New York State, or any of their instrumentalities, agencies, or political subdivisions (or any public corporation, including a public corporation created pursuant to agreement or compact with another state or Canada) ..... a ☒

b. Conveyance is to secure a debt or other obligation ..... b ☐

c. Conveyance is without additional consideration to confirm, correct, modify, or supplement a prior conveyance ..... c ☐

d. Conveyance of real property is without consideration and not in connection with a sale, including conveyances conveying realty as bona fide gifts ..... d ☐

e. Conveyance is given in connection with a tax sale ..... e ☐

f. Conveyance is a mere change of identity or form of ownership or organization where there is no change in beneficial ownership. (This exemption cannot be claimed for a conveyance to a cooperative housing corporation of real property comprising the cooperative dwelling or dwellings.) Attach Form TP-584.1, Schedule F ..... f ☐

g. Conveyance consists of deed of partition ..... g ☐

h. Conveyance is given pursuant to the federal Bankruptcy Act ..... h ☐

i. Conveyance consists of the execution of a contract to sell real property, without the use or occupancy of such property, or the granting of an option to purchase real property, without the use or occupancy of such property ..... i ☐

j. Conveyance of an option or contract to purchase real property with the use or occupancy of such property where the consideration is less than $200,000 and such property was used solely by the grantor as the grantor's personal residence and consists of a one-, two-, or three-family house, an individual residential condominium unit, or the sale of stock in a cooperative housing corporation in connection with the grant or transfer of a proprietary leasehold covering an individual residential cooperative apartment ..... j ☐

k. Conveyance is not a conveyance within the meaning of Tax Law, Article 31, § 1401(e) *(attach documents supporting such claim)* ..... k ☐

Schedule C – Credit Line Mortgage Certificate (Tax Law Article 11)

Complete the following only if the interest being transferred is a fee simple interest.
This is to certify that: *(mark an **X** in the appropriate box)*

1. ☐ The real property being sold or transferred is not subject to an outstanding credit line mortgage.

2. ☐ The real property being sold or transferred is subject to an outstanding credit line mortgage. However, an exemption from the tax is claimed for the following reason:
   - a ☐ The transfer of real property is a transfer of a fee simple interest to a person or persons who held a fee simple interest in the real property (whether as a joint tenant, a tenant in common or otherwise) immediately before the transfer.
   - b ☐ The transfer of real property is (A) to a person or persons related by blood, marriage or adoption to the original obligor or to one or more of the original obligors or (B) to a person or entity where 50% or more of the beneficial interest in such real property after the transfer is held by the transferor or such related person or persons (as in the case of a transfer to a trustee for the benefit of a minor or the transfer to a trust for the benefit of the transferor).
   - c ☐ The transfer of real property is a transfer to a trustee in bankruptcy, a receiver, assignee, or other officer of a court.
   - d ☐ The maximum principal amount secured by the credit line mortgage is $3 million or more, and the real property being sold or transferred is **not** principally improved nor will it be improved by a one- to six-family owner-occupied residence or dwelling.

     Note: for purposes of determining whether the maximum principal amount secured is $3 million or more as described above, the amounts secured by two or more credit line mortgages may be aggregated under certain circumstances. See TSB-M-96(6)-R for more information regarding these aggregation requirements.
   - e ☐ Other *(attach detailed explanation)*.

3. ☐ The real property being transferred is presently subject to an outstanding credit line mortgage. However, no tax is due for the following reason:
   - a ☐ A certificate of discharge of the credit line mortgage is being offered at the time of recording the deed.
   - b ☐ A check has been drawn payable for transmission to the credit line mortgagee or the mortgagee's agent for the balance due, and a satisfaction of such mortgage will be recorded as soon as it is available.

4. ☐ The real property being transferred is subject to an outstanding credit line mortgage recorded in _____ (insert liber and page or reel or other identification of the mortgage). The maximum principal amount of debt or obligation secured by the mortgage is _____. No exemption from tax is claimed and the tax of _____ is being paid herewith. *(Make check payable to county clerk where deed will be recorded or, if the recording is to take place in New York City but not in Richmond County, make check payable to the **NYC Department of Finance.**)*

Signature (both the grantors and grantees must sign)

The undersigned certify that the above information contained in Schedules A, B, and C, including any return, certification, schedule, or attachment, is to the best of their knowledge, true and complete, and authorize the person(s) submitting such form on their behalf to receive a copy for purposes of recording the deed or other instrument effecting the conveyance.

Grantor signature	Title	Grantee signature	Title
	Authorized Signatory		

Grantor signature	Title	Grantee signature	Title

Reminder: Did you complete all of the required information in Schedules A, B, and C? Are you required to complete Schedule D? If you marked *e*, *f*, or *g* in Schedule A, did you complete Form TP-584.1? If the contract was executed prior to April 1, 2019, did you attach the necessary verification? Have you attached your check(s) made payable to the county clerk where recording will take place or, if the recording is in the New York City boroughs of Manhattan, Bronx, Brooklyn, or Queens, to the ***NYC Department of Finance***? If no recording is required, send this return and your check(s), made payable to the ***NYS Department of Taxation and Finance***, directly to the NYS Tax Department, RETT Return Processing, PO Box 5045, Albany NY 12205-0045. If not using U.S. Mail, see Publication 55, *Designated Private Delivery Services*.

Schedule D – Certification of exemption from the payment of estimated personal income tax (Tax Law, Article 22, § 663)

Complete the following only if a fee simple interest or a cooperative unit is being transferred by an individual or estate or trust.

If the property is being conveyed by a referee pursuant to a foreclosure proceeding, proceed to Part 2, mark an *X* in the second box under *Exemptions for nonresident transferors/sellers*, and sign at bottom.

Part 1 – New York State residents

If you are a New York State resident transferor/seller listed in Form TP-584-NYC, Schedule A (or an attachment to Form TP-584-NYC), you must sign the certification below. If one or more transferors/sellers of the real property or cooperative unit is a resident of New York State, **each** resident transferor/seller must sign in the space provided. If more space is needed, photocopy this Schedule D and submit as many schedules as necessary to accommodate all resident transferors/sellers.

Certification of resident transferors/sellers

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor/seller as signed below was a resident of New York State, and therefore is not required to pay estimated personal income tax under Tax Law § 663(a) upon the sale or transfer of this real property or cooperative unit.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

Note: A resident of New York State may still be required to pay estimated tax under Tax Law § 685(c), but not as a condition of recording a deed.

Part 2 – Nonresidents of New York State

If you are a nonresident of New York State listed as a transferor/seller in Form TP-584-NYC, Schedule A (or an attachment to Form TP-584-NYC) but are not required to pay estimated personal income tax because one of the exemptions below applies under Tax Law § 663(c), mark the box of the appropriate exemption below. If any one of the exemptions below applies to the transferor/seller, that transferor/seller is not required to pay estimated personal income tax to New York State under Tax Law § 663. **Each** nonresident transferor/seller who qualifies under one of the exemptions below must sign in the space provided. If more space is needed, photocopy this Schedule D and submit as many schedules as necessary to accommodate all nonresident transferors/sellers.

If none of these exemption statements apply, you must complete Form IT-2663, *Nonresident Real Property Estimated Income Tax Payment Form*, or Form IT-2664, *Nonresident Cooperative Unit Estimated Income Tax Payment Form*. For more information, see *Payment of estimated personal income tax,* on Form TP-584-NYC-I, page 1.

Exemption for nonresident transferors/sellers

This is to certify that at the time of the sale or transfer of the real property or cooperative unit, the transferor/seller (grantor) of this real property or cooperative unit was a nonresident of New York State, but is not required to pay estimated personal income tax under Tax Law § 663 due to one of the following exemptions:

☐ The real property or cooperative unit being sold or transferred qualifies in total as the transferor's/seller's principal residence (within the meaning of Internal Revenue Code, section 121) from _____ (Date) to _____ (Date) *(see instructions)*.

☐ The transferor/seller is a mortgagor conveying the mortgaged property to a mortgagee in foreclosure, or in lieu of foreclosure with no additional consideration.

☐ The transferor or transferee is an agency or authority of the United States of America, an agency or authority of New York State, the Federal National Mortgage Association, the Federal Home Loan Mortgage Corporation, the Government National Mortgage Association, or a private mortgage insurance company.

Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date
Signature	Print full name	Date

SYMBOL LEGEND

CONC. MONUMENT FND	MAIL BOX
I.P. / I.B. FND	CABLE TV BOX
TACK / STAKE FND	TELEPHONE BOX
SPOT ELEVATIONS x 103.55	A/C UNIT
TRAFFIC SIGNAL POLE	TRANSFORMER
UTILITY POLE	ELECTRIC METER
GUY WIRE	GAS METER
UTILITY POLE W/LIGHT	WATER METER
LIGHT POLE	WATER VALVE
SIGN	GAS VALVE
FIRE HYDRANT	CLEAN OUT
D.W.P. DETECTABLE WARNING PAD	GAS
D.C. DEPRESSED CURB	WATER
L.S.A. LANDSCAPED AREA	ELECTRIC
WELL	TELEPHONE
MANHOLE	CABLE TV
"A"–INLET	TREE
"B"–INLET	SHRUB
"E"–INLET	BOLLARD
YARD INLET	MONITORING WELL
FLARED END SECTION	WETLAND FLAG

SYMBOL LEGEND

CONC. MONUMENT FND	FIRE HYDRANT	MAIL BOX	CLEAN OUT
I.P. / I.B. FND	D.C. DEPRESSED CURB	CABLE TV BOX	GAS
TACK / STAKE FND	L.S.A. LANDSCAPED AREA	TELEPHONE BOX	WATER
WETLAND FLAG	D.W.P. DETECTABLE WARNING PAD	A/C UNIT	ELECTRIC
SPOT ELEVATIONS x 103.55	MANHOLE	TRANSFORMER	TELEPHONE
TRAFFIC SIGNAL POLE	"A"–INLET	ELECTRIC METER	CABLE TV
UTILITY POLE	"B"–INLET	GAS METER	TREE
GUY WIRE	"E"–INLET	WATER METER	SHRUB
LIGHT POLE	YARD INLET	WATER VALVE	BOLLARD
UTILITY POLE W/LIGHT	FLARED END SECTION	GAS VALVE	MONITORING WELL
SIGN			WELL

This property is subject to an Environmental Easement held by the New York State Department of Environmental Conservation pursuant to Title 36 of Article 71 of the New York Environmental Conservation Law.

THE ENGINEERING AND INSTITUTIONAL CONTROLS for the Easement are set forth in more detail in the Site Management Plan ("SMP"). A copy of the SMP must be obtained by any party with an interest in the property. The SMP may be obtained from the New York State Department of Environmental Conservation, Division of Environmental Remediation, Site Control Section, 625 Broadway, Albany, NY 12233 or at derweb@dec.ny.gov.

ENVIRONMENTAL EASEMENT BOUNDARY

Environmental Easement Area Access

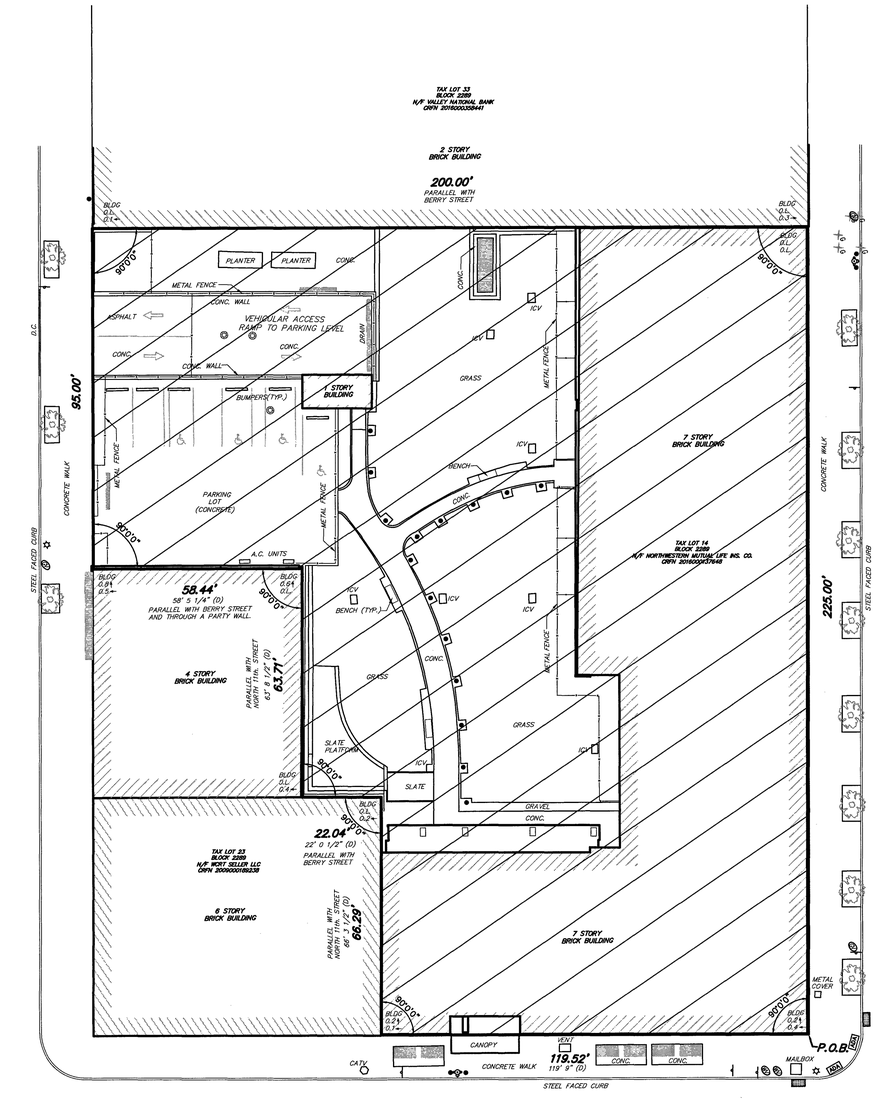
The DEC or their agent may access the easement area as shown hereon through any existing street access or building ingress/egress access point.

MAP REFERENCES:

1. SHEET 3 OF BOROUGH OF BROOKLYN ALTERATION MAPS ISSUED BY THE OFFICE OF THE BROOKLYN BOROUGH PRESIDENT.
2. TAX MAPS PREPARED FOR THE BOROUGH OF BROOKLYN.

GENERAL NOTES:

1. THIS SURVEY IS PREPARED IN ACCORDANCE WITH DOCUMENTS SUPPLIED BY THE CLIENT AND THOSE OBTAINED THROUGH SUPPLEMENTAL RESEARCH BY DPK. THE DOCUMENTS UTILIZED MAY OR MAY NOT REPRESENT ALL THE TITLE DOCUMENTS RELEVANT TO THE SUBJECT PROPERTY. IT IS STRONGLY SUGGESTED THAT A COMPLETE TITLE SEARCH BE SUPPLIED TO THE SURVEYOR FOR REVIEW PRIOR TO THE PLACEMENT OF OR ALTERATION TO IMPROVEMENTS ON THE PROPERTY.
2. THIS SURVEY IS SUBJECT TO ANY EASEMENTS OF RECORD AND ANY OTHER PERTINENT FACTS THAT A COMPLETE TITLE SEARCH MIGHT DISCLOSE.
3. THIS SURVEY REPRESENTS FIELD CONDITIONS AS OF NOVEMBER 15, 2021.
4. THE UTILITIES SHOWN HAVE BEEN LOCATED FROM EVIDENCE OBSERVED ON THE SURFACE ONLY OR HAVE BEEN SHOWN GRAPHICALLY PER SUPPLIED MATERIALS. DPK LAND SURVEYING MAKES NO GUARANTEES THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN-SERVICE OR ABANDONED. DPK LAND SURVEYING FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED. DPK LAND SURVEYING HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
5. PREMISES ARE COMMONLY KNOWN AS 34 BERRY STREET, BROOKLYN, NEW YORK.
6. ALSO KNOWN AS LOT 14 IN SECTION 8, BLOCK 2289 AS SHOWN ON THE OFFICIAL TAX MAPS OF THE BOROUGH OF BROOKLYN, CITY OF NEW YORK.
7. THE PROJECT VERTICAL DATUM IS BASED UPON NAVD 88 DERIVED USING RTK RECEIVERS AND KEYNET.
8. IF THIS DOCUMENT DOES NOT CONTAIN A RAISED SEAL OF THE UNDERSIGNED PROFESSIONAL, IT IS NOT AN AUTHORIZED ORIGINAL DOCUMENT.



BERRY STREET
(60' R.O.W. PER TAX MAP)

ENVIRONMENTAL EASEMENT BOUNDARY

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

GRAPHIC SCALE
20 0 10 20
(IN FEET)
1 inch = 20 ft.

NY LONG ISLAND STATE PLANE COORDINATE GRID MAD 1983

RECORD DESCRIPTION

BLOCK 2289 LOT 14:

ALL THAT CERTAIN PLOT, PIECE OR PARCEL OF LAND, SITUATE, LYING AND BEING IN THE BOROUGH OF BROOKLYN, COUNTY OF KINGS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE NORTHWESTERLY SIDE OF BERRY STREET WITH THE SOUTHWESTERLY SIDE OF NORTH 12th. STREET;

RUNNING THENCE NORTHWESTERLY ALONG THE WESTERLY SIDE OF NORTH 12th. STREET 225 FEET;

THENCE SOUTHWESTERLY PARALLEL WITH BERRY STREET, 200 FEET TO THE NORTHEASTERLY SIDE OF NORTH 11th. STREET;

THENCE SOUTHEASTERLY ALONG THE NORTHEASTERLY SIDE OF NORTH 11th. STREET, 95 FEET;

THENCE NORTHEASTERLY PARALLEL WITH BERRY STREET 58 FEET 5-1/4 INCHES;

THENCE SOUTHEASTERLY PARALLEL WITH NORTH 11th. STREET, 63 FEET 8-1/2 INCHES;

THENCE NORTHEASTERLY PARALLEL WITH BERRY STREET, 22 FEET $\frac{1}{2}$ INCH;

THENCE SOUTHEASTERLY PARALLEL WITH NORTH 11th. STREET, 66 FEET 3-1/2 INCHES TO THE NORTHWESTERLY SIDE OF BERRY STREET;

THENCE NORTHEASTERLY ALONG THE NORTHWESTERLY SIDE OF BERRY STREET APPROXIMATELY 119 FEET 9 INCHES TO THE POINT OR PLACE OF BEGINNING.

ENVIRONMENTAL EASEMENT DESCRIPTION

ALL THAT CERTAIN LOT, PIECE OR PARCEL OF LAND, WITH THE BUILDINGS AND IMPROVEMENTS THEREON ERECTED, SITUATE, LYING AND BEING IN THE BOROUGH OF BROOKLYN, COUNTY OF KINGS, CITY AND STATE OF NEW YORK, BOUNDED AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE CORNER FORMED BY THE NORTHWESTERLY SIDE OF BERRY STREET (60' WIDE PER TAX MAP) WITH THE SOUTHWESTERLY SIDE OF NORTH 12th. STREET (60' WIDE PER TAX MAP);

1. RUNNING THENCE NORTHWESTERLY ALONG SAID SOUTHWESTERLY SIDE OF NORTH 12th. STREET 225.00 FEET TO A POINT;
2. THENCE SOUTHWESTERLY, PARALLEL WITH BERRY STREET AND FORMING AN INTERIOR ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS WITH THE PREVIOUS COURSE, 200.00 FEET TO A POINT ON THE NORTHEASTERLY SIDE OF NORTH 11th. STREET;
3. THENCE SOUTHEASTERLY ALONG SAID NORTHEASTERLY SIDE OF NORTH 11th. STREET AND FORMING AN INTERIOR ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS WITH THE PREVIOUS COURSE, 95.00 FEET TO A POINT;
4. THENCE NORTHEASTERLY PARALLEL WITH BERRY STREET AND FORMING AN INTERIOR ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS WITH THE PREVIOUS COURSE 58.44 FEET TO A POINT;
5. THENCE SOUTHEASTERLY PARALLEL WITH NORTH 11th. STREET AND FORMING AN EXTERIOR ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS WITH THE PREVIOUS COURSE 63.71 FEET TO A POINT;
6. THENCE NORTHEASTERLY PARALLEL WITH BERRY STREET AND FORMING AN INTERIOR ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS WITH THE PREVIOUS COURSE 22.04 FEET TO A POINT;
7. THENCE SOUTHEASTERLY PARALLEL WITH NORTH 11th. STREET AND FORMING AN EXTERIOR ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS WITH THE PREVIOUS COURSE 66.29 FEET TO A POINT ON SAID NORTHWESTERLY SIDE OF BERRY STREET;
8. THENCE ALONG SAID NORTHWESTERLY SIDE OF BERRY STREET AND FORMING AN INTERIOR ANGLE OF 90 DEGREES 00 MINUTES 00 SECONDS WITH THE PREVIOUS COURSE 119.52 FEET TO THE POINT OR PLACE OF BEGINNING.

THE ABOVE DESCRIBED EASEMENT HAS AN AREA CONTAINING 35,942 SQUARE FEET OR 0.8251 ACRES OF LAND.

REV	DATE	DESCRIPTION	BY	CHKD
2.	05-26-2022	ENVIRONMENTAL EASEMENT SHOWN	R.B.	J.J.H.
1.	12-29-2021	REMOVE SHEET 2	R.B.	J.M.

DATE 5/26/2022
N.J. Lic: 24GS04331100
PA. Lic: SU075616
N.Y. Lic: 050932-1
CT. Lic: 70476

I, the undersigned, certify that the survey represented hereon was performed by me or under my direct supervision on the date(s) of survey shown hereon; that this plan is based on a field survey made under my direct supervision on the date(s) of survey shown hereon; that this survey represents the conditions found on the date of the survey, except easements, if any, below and/or not shown hereon; that the monuments shown hereon exist as described; that all dimensional and environmentally sensitive areas were not located or made by this survey; that this survey is subject to any facts that may be disclosed by a full and accurate title search; that this survey is subject to information in the title register and the map/plat filed in the county clerk's office; and that this declaration is given to the purchaser named hereon as the current owner of the property described hereon.

JAMES E. JOHNSON
LICENSED LAND SURVEYOR
NEW YORK LICENSE NO. 050932

DPK LAND SURVEYING LLC
CORPORATE OFFICE: 285 EDISON, NJ 08817
P:732-754-9100 F:732-754-9500
NEW YORK CERTIFICATE OF AUTHORIZATION NO. 001585

DPK LAND SURVEYING

BOUNDARY SURVEY
TAX LOT 14
SECTION 8 BLOCK 2289
34 BERRY STREET
BOROUGH OF BROOKLYN
COUNTY OF KINGS
CITY AND STATE OF NEW YORK

DRAWN BY: R.B.
CHK'D BY: J.M.
SCALE: 1" = 20'
DATE: 11/22/2021

DRAWING FILE: 16-7469TP00
PROJECT NUMBER: 16-7469
SHEET 1 OF 1
REV. 2

S:\Projects\2016\16-7469\CAD\16-7469TP00.dwg May 27, 2022-10:58am BT(Montbuchanan)

STATE OF NEW YORK

DEPARTMENT OF STATE

Certificate of Status

I, ROBERT J. RODRIGUEZ, Secretary of State of the State of New York and custodian of the records required by law to be filed in my office, do hereby certify that upon a diligent examination of the records of the Department of State, as of the date and time of this certificate, the following entity information is reflected:

Entity Name:	34 BERRY STREET LLC
DOS ID Number:	3605971
Entity Type:	FOREIGN LIMITED LIABILITY COMPANY
Entity Status:	AUTHORIZED
Date of Initial Filing with DOS:	12/17/2007
Statement Status:	CURRENT
Statement Due Date:	12/31/2023

No information is available from this office regarding the financial condition, business activity or practices of this entity.

WITNESS my hand and official seal of the Department of State, at the City of Albany, on June 02, 2022 at 12:25 P.M.

ROBERT J. RODRIGUEZ, Secretary of State

By Brendan C. Hughes
Executive Deputy Secretary of State

Authentication Number: 100001658815 To Verify the authenticity of this document you may access the Division of Corporation's Document Authentication Website at http://ecorp.dos.ny.gov

CERTIFICATE OF INCUMBENCY

The undersigned, Senior Vice President/General Counsel/Secretary of LCOR Residential Associates LLC, a Delaware limited liability company, does hereby certify that:

1. LCOR Residential Associates LLC, is the sole member of 34 Berry Street LLC, a Delaware limited liability company;

2. Seth R. Landau is the duly appointed and acting Senior Vice President/General Counsel/Secretary of LCOR Residential Associates LLC and 34 Berry Street LLC per the consent approved by the Management Committee of LCOR Residential Associates LLC, effective as of January 1, 2021.

IN WITNESS WHEREOF, the undersigned executed this certificate as of the 13th day of April 2022.

LCOR Residential Associates LLC, a
Delaware limited liability company

By: _____
Name: Seth R. Landau
Title: Senior Vice President

225 50

Standard N.Y.B.T.U. Form 8002-6-71 — Warranty Deed With Full Covenants — Individual or Corporation.

CON8275 PAGE 44

THIS INDENTURE, made the 22nd day of September, nineteen hundred and fifty-four

BETWEEN THE NEW YORK QUININE AND CHEMICAL WORKS, INC., a New York Corporation, having an office at 50 Church Street, New York, N. Y.,

party of the first part, and NATIONAL ALMOND PRODUCTS CORPORATION, a New York corporation having a place of business at 129 Patchen Avenue, Brooklyn, N. Y.,

party of the second part,

WITNESSETH, that the party of the first part, in consideration of ONE HUNDRED ($100.00) Dollars and other good and valuable consideration lawful money of the United States,

by the party of the second part, does hereby grant and release unto the party of the second part, the heirs or successors and assigns of the party of the second part forever,

ALL that certain plot, piece or parcel of land, with the buildings and improvements thereon erected, situate, lying and being in the Borough of Brooklyn, County of Kings, City and State of New York, described as follows:

BEGINNING at the corner formed by the intersection of the southwesterly side of North Twelfth Street with the northwesterly side of Berry Street; running thence southwesterly along the northwesterly side of Berry Street 200 feet to the northeasterly side of North Eleventh Street, thence northwesterly along the northeasterly side of North Eleventh Street 225 feet, thence northeasterly parallel with Berry Street 200 feet to the southwesterly side of North Twelfth Street and thence southeasterly along the southwesterly side of North Twelfth Street 225 feet to the corner, the point or place of beginning.

SUBJECT to a purchase money mortgage in the principal sum of One hundred sixty-five thousand ($165,000.00) dollars, of even date, executed and simultaneously herewith delivered by party of the second part to party of the first part.

SUBJECT ALSO TO:

1. Building restrictions and regulations in resolution or ordinance adopted by the Board of Estimate and Apportionment of the City of New York, July 25, 1916 and amendments and additions thereto now in force.

2. Encroachments of stoops, areas, or cellar steps, if any, upon any street or highway, as well as any state of facts an accurate survey would show.

3. Easements, covenants and restrictions of record.

TOGETHER with all right, title and interest, if any, of the party of the first part of, in and to any streets and roads abutting the above-described premises to the center lines thereof.

TOGETHER with the appurtenances and all the estate and rights of the party of the first part in and to said premises.

TO HAVE AND TO HOLD the premises herein granted unto the party of the second part, the heirs or successors and assigns of the party of the second part forever.

AND the party of the first part, in compliance with Section 13 of the Lien Law, covenants that the party of the first part will receive the consideration for this conveyance and will hold the right to receive such consideration as a trust fund to be applied first for the purpose of paying the cost of the improvement and will apply the same first to the payment of the cost of the improvement before using any part of the total of the same for any other purpose.

AND the party of the first part covenants as follows:

FIRST.—That said party of the first part is seized of the said premises in fee simple, and has good right to convey the same;

SECOND.—That the party of the second part shall quietly enjoy the said premises;

THIRD.—That the said premises are free from incumbrances, except as aforesaid;

FOURTH.—That the party of the first part will execute or procure any further necessary assurance of the title to said premises;

FIFTH.—That said party of the first part will forever warrant the title to said premises.

The word "party" shall be construed as if it read "parties" whenever the sense of this indenture so requires.

IN WITNESS WHEREOF, the party of the first part has duly executed this deed the day and year first above written.

IN PRESENCE OF:

Marion K. O'Connell

THE NEW YORK QUININE AND CHEMICAL WORKS, INC.

BY _____ (L.S.)
President

CON 8275 PAGE 46

STATE OF NEW YORK, COUNTY OF ss.:

On the day of 19 , before me personally came

to me known to be the individual described in and who executed the foregoing instrument, and acknowledged that executed the same.

STATE OF NEW YORK, COUNTY OF ss.:

On the day of 19 , before me personally came

to me known to be the individual described in and who executed the foregoing instrument, and acknowledged that executed the same.

STATE OF NEW YORK, COUNTY OF NEW YORK ss.:

On the 22nd day of September 1954, before me personally came S. B. PENICK, JR. to me known, who, being by me duly sworn, did depose and say that he resides at No. 173 Gates Avenue, Montclair, New Jersey; that he is the President of the NEW YORK QUININE AND CHEMICAL WORKS, INC., the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the board of directors of said corporation; and that he signed his name thereto by like order.

Notary Public

MAUD A. HALL
Notary Public, State of New York
No. 31-0725750
Qualified in New York County
Term Expires March 30, 1955

STATE OF NEW YORK, COUNTY OF ss.:

On the day of 19 , before me personally came the subscribing witness to the foregoing instrument, with whom I am personally acquainted, who, being by me duly sworn, did depose and say that he resides at No.

that he knows to be the individual described in and who executed the foregoing instrument; that he, said subscribing witness, was present and saw execute the same; and that he, said witness, at the same time subscribed h name as witness thereto.

Title No. 2 2 2 3 3

THE NEW YORK QUININE AND CHEMICAL WORKS, INC.

to

NATIONAL ALMOND PRODUCTS CORPORATION

Dated, September 22, 1954

Recorded at Request of

Warranty Deed
With Full Covenants

The land affected by the within instrument is in Block 2 in Section 2 in the Land Map of the County of Kings

CITY TITLE

ASSESSED VALUATION FOR PURPOSE OF RECORDING OFFICE

1954 SEP 24 AM 10:17

SEP-2454 143516

OFFICE OF CITY REGISTER
Kings County
RECORDED IN BOOKS
Witness my hand and official seal

Lewis Orgel

CITY REGISTER

APPENDIX B
MONITORING WELL BORING AND CONSTRUCTION LOGS

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Monitoring Well ID: Sheet 1 of 1	MW-3R	Soil Boring ID:	SB-3R

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia Hollow Stem Auger
Sampling Method:	5' Macrocore
Driller:	ADT
Weather:	54°F, Sunny
Logged by:	M. Jepsen

Drilling

Start Time: 10:10 **Finish Time:** 14:40

Date: 10/24/2018

Surface Condition: Concrete

Well Construction:
- Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.
- 4" diameter PVC well casing: grade to 3' below grade.
- Bentonite seal: 1' to 2' below grade.
- No. 2 morie sandpack filter: 2' to 13' below grade.
- 0.020-inch slotted 4'' PVC well screen: 3' to 13'.
- End cap: 13' below grade.

Depth (feet)	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1–5	N/A	NO RECOVERY. (Macrocore refusal on cobbles/boulders. Ground through with hollow stem auger)	N/A	N/A	N/A	N/A	
6–10	26"	Dark Brown SAND, trace Silt.	Strong Petroleum-like odor	Wet	425	NAPL Sheen	
11–13	20"	Top 10": Dark Brown to Gray SAND, trace Silt.	Strong Petroleum-like odor	Wet	73	NAPL Sheen	
		Bottom 10": Light Brown CLAY, some Silt.	Strong Petroleum-like odor	Wet	104	NAPL Sheen	
14–20							

Notes: Groundwater Depth Indicator

Groundwater was measured at 5.89 feet below grade in MW-3R on 10/29/2018.

Groundwater monitoring well installed to 13 feet below grade.

No soil samples collected.

Groundwater encountered at approximately 5 feet below grade during soil boring advancement.

End of soil boring at 13 feet below grade.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Monitoring Well ID: Sheet 1 of 2	MW-22D	Soil Boring ID:	SB-22D

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia Hollow Stem Auger
Sampling Method:	5' Macrocore
Driller:	ADT
Weather:	55°F, Sunny
Logged by:	M. Jepsen

Drilling

Start Time: 10:25 **Finish Time:** 12:00

Date: 10/25/2018 to 10/30/2018

Surface Condition: Concrete

Well Construction: Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.

Non-shrinking cement grout: 1' to 27' below grade.

2" diameter PVC well casing: grade to 30' below grade

Depth (feet)	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1–5	48	CONCRETE, trace Rebar.	None	Dry	ND	ND	
6–8	18	Light Brown SAND, trace Silt, Gravel.	None	Wet	ND	ND	
9–10	N/A	NO RECOVERY. (Macrocore refusal on cobbles/boulders. Ground through with hollow stem auger)	N/A	N/A	N/A	N/A	
11–14	36	Top 24": Light Brown SAND, little Silt, trace Gravel.	None	Wet	12.4	ND	
		Bottom 12": Dark Brown and Black SAND and SILT, trace Gravel.	Faint solvent-like odor	Wet	12.3	Staining present	SB-22D_14-15_20181026
15–19	26	Top 12": SLOUGH (from above).	None	Wet	0.4	ND	
		Bottom 14": Dark Brown SAND and SILT, trace Gravel.	None	Wet	2.1	ND	
20							

Notes: Groundwater Depth Indicator

Groundwater was measured at 6.12 feet below grade in MW-22D on 11/7/2018.

Groundwater monitoring well installed to 35 feet below grade.

Soil sample analyzed for Volatile Organic Compounds (EPA 8260) and Semi Volatile Organic Compounds (EPA 8270).

Groundwater encountered at approximately 5 feet below grade during soil boring advancement.

End of soil boring at 35 feet below grade.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Monitoring Well ID: Sheet 2 of 2	MW-22D	Soil Boring ID:	SB-22D

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia Hollow Stem Auger
Sampling Method:	5' Macrocore
Driller:	ADT
Weather:	55°F, Sunny
Logged by:	M. Jepsen

Drilling

Start Time: 10:25 **Finish Time:** 12:00

Date: 10/25/2018 to 10/30/2018

Surface Condition: Concrete

Depth (feet)	Well Construction	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
21		N/A	NO RECOVERY. (Macrocore refusal on cobbles/boulders. Ground through with hollow stem auger)	N/A	N/A	N/A	N/A	
22								
23								
24								
25								
26								
27								
28	Bentonite seal: 27' to 29' below grade.	30	Brown SAND, some Silt, Gravel.	ND	Wet	ND	ND	
29								
30								
31	No. 2 morie sandpack filter: 29' to 35' below grade.	N/A	NO RECOVERY. (Macrocore refusal on cobbles/boulders. Ground through with hollow stem auger)	N/A	N/A	N/A	N/A	
32								
33	0.020-inch slotted 2" PVC well screen: 30' to 35'.							
34								
35	End cap: 35' below grade.							
36								
37								
38								
39								
40								

Notes: **Groundwater Depth Indicator**

Groundwater was measured at 6.12 feet below grade in MW-22D on 11/7/2018.

Groundwater monitoring well installed to 35 feet below grade.

Soil sample analyzed for Volatile Organic Compounds (EPA 8260) and Semi Volatile Organic Compounds (EPA 8270).

Groundwater encountered at approximately 5 feet below grade during soil boring advancement.

End of soil boring at 35 feet below grade.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Monitoring Well ID: Sheet 1 of 1	MW-26	Soil Boring ID:	SB-26

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Remote Geoprobe
Sampling Method:	3' Macrocore
Driller:	ADT
Weather:	58°F, Cloudy
Logged by:	M. Jepsen

Drilling

Start Time: 12:18 **Finish Time:** 13:45

Date: 10/23/2018

Surface Condition: Concrete

Well Construction:
- Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.
- Bentonite seal: 1' to 2' below grade
- 2" diameter PVC well casing: grade to 4' below grade.
- No. 2 morie sandpack filter: 2' to 14' below grade.
- 0.020-inch slotted 2" PVC well screen: 4' to 14'.
- End cap: 14' below grade.

Depth (feet)	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1	26	Top 10": CONCRETE.	None	Dry	4.3	ND	
2		Bottom 16": Light Brown SAND, little Silt, trace fine Gravel.	Faint Petroleum-like odor	Dry	17	ND	
3	32	Top 4": SLOUGH (from above).	Strong Petro-like odor	Dry	9.5	ND	
4		Bottom 28": Black SAND, little Silt, trace fine Gravel.	Strong Petroleum-like odor	Moist	23.3	NAPL	SB-26_4-6_20181023
5							
6	34	Top 8": SLOUGH (from above).	Strong Petroleum-like odor	Moist	17.9	NAPL	
7		Bottom 26": Black SAND, little Silt, trace fine Gravel.	Strong Petroleum-like odor	Moist	13.5	NAPL	
8							
9	36	Top 7": Black SAND, little Silt, trace fine Gravel.	Slight Petroleum-like odor	Wet	11.9	NAPL	
10		Bottom 29": Light Brown CLAY, trace Sand, fine Gravel.	Slight Petroleum-like odor	Wet	4.5	NAPL	
11						ND	
12	25	Top 8": SLOUGH (from above).	Strong Petro odor	Wet	6.2	ND	
13		Bottom 17": Light Brown CLAY, trace Sand, fine Gravel.	Slight Petroleum-like odor	Wet	3.3	ND	
14							
15							
16							
17							
18							
19							
20							

Notes: Groundwater Depth Indicator

Groundwater measured at 5.10 ft below grade in MW-26 on 10/24/2018.

Groundwater monitoring well installed to 14 feet below grade.

Soil sample analyzed for Volatile Organic Compounds (EPA 8260) and Semi Volatile Organic Compounds (EPA 8270). Bline duplicate sample "SB-X_4-6_20181023" collected at SB-26 (4-6).

Groundwater encountered at approximately 5.5' feet below grade during soil boring advancement.

End of soil boring at 15 feet below grade.

PID = photoionization detector ppm = parts per million NAPL = non-aqueous phase liquid ND = not detected

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-1**
Sheet 1 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Ashutosh Sharma / David Heintz

Drilling
Start Time 13:45 **Finish Time** 15:20
Date: 3/8/2010
Weather: Sunny; 40-50 ºF

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1 2 3 4 5			Hand cleared to 5-feet below ground surface (bgs).	None	Dry	ND	None	
6 7	2"	7 8 10 12	CONCRETE (Slough).	None	Dry	ND	None	
8 9	0"	1 1 1 1	No Recovery.	None	NA	NA	NA	
10 11	5"	1 1 1 1	Top 3": WOOD (FILL) Bottom 2": Dark brown SAND, trace fine Gravel, Wood (FILL).	None None	Moist Moist	ND ND	None None	
12 13	6"	2 3 4 1	Brown SAND, trace Silt and fine Gravel.	Slight Organic Odor	Wet	0.5	ND	SB-1 (12'-13')
14	12"	5 6	Top 9": Brown SAND, trace fine Gravel, Plastic (Fill). Bottom 3": Brown fine SAND, some Clay.	Slight Organic Odor	Moist	ND	None	
15 16 17			Obstruction encountered at 14' bgs (50 blow counts for 2-inches). Augered through obstruction to 17'.	NA	NA	NA	NA	

Notes: Groundwater encountered at approximately 13-feet below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-1 (12'-13'), SB-1 (17'-18'), and SB-1 (19'-20') were collected and sent to laboratory for analysis of Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270)

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-1**
Sheet 2 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Ashutosh Sharma / David Heintz

Drilling
Start Time 13:45 **Finish Time** 15:20
Date: 3/8/2010
Weather: Sunny; 40-50 ºF

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
18	14"	9 8 7 8	Top 10": Dark brown SAND, trace Clay, fine Gravel, and Wood (FILL). Bottom 4": Brown fine to medium SAND, some Clay.	Slight Organic Odor	Dry	1.4 1.6	ND	SB-1 (17'-18')
19								
20	15"		Brown SAND, some Clay, trace Wood (FILL).	Slight Organic Odor	Wet	8.0 3.0	None	SB-1 (19'-20')
21								
22			Red-brown fine SAND, some Clay, trace Brick, Wood (FILL).	Slight Organic Odor	Wet	5.5	None	
23								
24			End of boring at 23' below ground surface.					
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								

Notes: Groundwater encountered at approximately 13' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-1 (12'-13'), SB-1 (17'-18'), and SB-1 (19'-20') were collected and sent to laboratory for analysis of Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-2**
Sheet 1 **of 2**

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Ashutosh Sharma / David Heintz

Drilling
Start Time 11:45 **Finish Time** 13:10
Date: 3/8/2010
Weather: Sunny; 40-50 ºF

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1 2 3 4 5			Hand cleared to 5-feet below ground surface (bgs).	None	Dry	ND	None	
6 7	8"	10 12 5 7	Top 3": CONCRETE (Slough). Bottom 5": Brown SAND, trace fine Gravel, Brick (FILL).	None	Dry	ND	None	
8 9	6"	8 7 9 4	Brown SAND, trace fine Gravel, Brick (FILL).	None	Dry	ND	None	
10 11	8"	8 6 4 7	Brown SAND, trace fine Gravel, Brick (FILL).	Slight Organic Odor	Dry	ND	None	SB-2 (10'-11')
12 13	2"	5 5 6 1	Gray-brown SAND, some Silt.	None	Wet	ND	Sheen	
14 15	15"	5 5 7 8	Top 4": Gray-brown fine SAND, some SILT. Bottom 11": Black-brown fine to medium SAND, some Silt.	Petroleum like odor	Wet	37.9	ND	SB-2 (13'-14')
16 17	10"	7 8 12 9	Top 6": Brown SAND, trace fine Gravel, Brick (FILL). Bottom 4": Dark-gray fine to medium SAND, some Silt.	Petroleum like odor	Wet	17.0 23.0	ND	

Notes: Groundwater encountered at approximately 13-feet below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector

NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-2 (10'-11') and SB-2 (13'-14') were collected and sent to laboratory for analysis of Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-2**
Sheet 2 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Ashutosh Sharma / David Heintz

Drilling
Start Time 11:45 **Finish Time** 13:10
Date: 3/8/2010
Weather: Sunny; 40-50 ºF

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
18	24"		Dark brow SAND, trace fine Gravel.	Petroleum like odor	Wet	14.0 16.0	Sheen (top 6")	
19						17.0		
20	15"		Dark brown SAND, trace Silt, fine Gravel, Brick (FILL).	Petroleum like odor	Wet	13	Sheen	
21						12.8		
22	20"		Dark brown SAND, trace Gravel, Silt, and Brick (FILL).	Petroleum like odor	Wet	14	None	
23						18.2		
24			End of boring at 23' below ground surface.					
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								

Notes: Groundwater encountered at approximately 13' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-2 (10'-11') and SB-2 (13'-14') were collected and sent to laboratory for analysis of Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-3**
Sheet 1 **of 2**

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Ashutosh Sharma / David Heintz

Drilling
Start Time 10:00 **Finish Time** 11:30
Date: 3/8/2010
Weather: Sunny; 40-50 ºF

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1 2 3 4 5			Hand cleared to 5-feet below ground surface (bgs).	None	Dry	ND	None	
6 7	6"	8 5 7 9	Brown SAND, some fine Gravel.	None	Dry	ND	None	
8 9	6"	2 2 2 2	Brown SAND, some Gravel.	None	Dry	ND	None	
10 11	6"	3 5 6 7	Brown SAND, some Gravel.	None	Dry	ND	None	
12 13	8"	3 5 7 9	Top 4": Brown fine SAND, some Gravel. Bottom 4": Brown fine SAND and SILT, trace Clay, Wood (FILL).	Slight Organic odor	Moist	ND	None	
14 15	12"	5 6 6 12	Brown fine SAND and SILT, trace Clay, Brick, Organic material (FILL).	Petroleum like odor	Moist	0.2 1.6	ND	SB-3 (14'-15')
16 17	20"		Top 2": Black-brown fine SAND, trace Organics. Middle 6": Brown SILT. Bottom 4": Brown SILT, trace Sand, fine Gravel.	Petroleum like odor	Wet	1.7	Sheen (middle)	SB-3 (15'-16')

Notes: Groundwater encountered at approximately 15' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-3 (14'-15'), SB-3 (15'-16'), and SB-3 (17'-18') were collected and sent to laboratory for analysis of Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-3**
Sheet 2 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Ashutosh Sharma / David Heintz

Drilling
Start Time 10:00 **Finish Time** 11:30
Date: 3/8/2010
Weather: Sunny; 40-50 ºF

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
18 - 19	10"		Black-brown SILT, trace fine Sand.	Slight Organic odor	Wet	2.6	None	SB-3 (17'-18')
20 - 21	4"		Gray-brown SILT, trace fine Gravel, Sand.	None	Wet	ND	None	
22 - 23	24"		Gray-brown fine SILT, trace Gravel, Clay, Sand.	None	Wet	ND	None	
24 - 34			End of boring at 23' below ground surface.					

Notes: Groundwater encountered at approximately 15' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-3 (14'-15'), SB-3 (15'-16'), and SB-3 (17'-18') were collected and sent to laboratory for analysis of Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street

AKRF Project Number: 11259

Boring No. **SB-4**

Sheet 1 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 13:05 **Finish Time** 15:45
Date: 4/13/2010
Weather: Cloudy, rain; 60ºF

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1 - 5			Hand cleared to 5-feet below ground surface (bgs). Cuttings consisted of brown SAND and SILT, some Gravel (concrete and stone mixed).	None	Dry	ND	None	
6 - 7	13"		Top 5": Dark brown SILT, some Sand. Middle 6": Brown SILT and SAND, trace fine Gravel. Bottom 2": Dark gray SAND and SILT, trace fine Gravel.	None	Dry	ND	None	
8 - 9	15"		Top 6": Dark gray SAND and SILT, trace fine Gravel. Bottom 9": Red-brown SAND and SILT, trace fine Gravel.	None	Dry	ND	None	SB-4 (7-9) SB-4 (9)
10 - 11	18"		Top 7": Dark gray SILT, some Sand. Middle 5": Light brown SILT, some Sand. Bottom 6": Red-brown SAND, little Silt, Gravel.	None	Wet	ND	None	SB-4 (9-11) SB-4 (10)
12 - 13	16"		Top 4": Dark Gray SILT, some Sand. Bottom 12": Red-brown SAND, some Silt, little Cobbles (3-inch plus).	None	Wet	ND	None	
14 - 15			Red-brown SAND and SILT, little Cobbles (3-inch plus).	None	Wet	ND	None	
16			Drilled through obstruction at 15-16'.	NA	NA	NA	NA	

Notes: Groundwater encountered at approximately 9' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector

NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-4(9), SB-4(7-9), SB-4(10) and SB-4(9-11) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-4**
Sheet 2 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 13:05 **Finish Time** 15:45
Date: 4/13/2010
Weather: Cloudy, rain; 60ºF

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
17 – 18	16"		Top 8": Brown-gray SILT, some Sand. Bottom 8": Brown-gray SILT, some Clay, little Sand.	None	Wet	ND	None	
19 – 20	14"		Top 6": Brown-gray SILT, little Clay. Bottom 8": Red-brown SAND and SILT, little Cobbles (3-inch plus).	None	Wet	ND	None	
21 – 33			End of boring at 20' below ground surface.					

Notes: Groundwater encountered at approximately 9' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-4(9), SB-4(7-9), SB-4(10) and SB-4(9-11) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street

AKRF Project Number: 11259

Boring No. **SB-5**

Sheet 1 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 13:15 **Finish Time** 15:00
Date: 4/12/2010
Weather: Sunny, Clear; 70F

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1 2 3 4 5			Hand cleared to 5-feet below ground surface (bgs). Cuttings consisted of dark brown SAND and SILT, little Concrete.	None	Dry	ND	None	
6 7	14"	1 2 4 3	Dark brown SAND and SILT, some Gravel.	None	Dry	ND	None	
8 9	11"	3 4 5 7	Top 8": Dark brown SILT, some Sand. Bottom 3": Yellow SAND, some gray Silt, some Gravel.	None	Dry	ND	None	
10 11	15"	7 8 11 15	Top 5": Dark brown SAND and SILT, little Gravel. Bottom 5": Brown SAND, some Silt, trace fine Gravel.	None	Dry	ND	None	SB-5 (10) SB-5 (10-11)
12 13		15 11 13 12	Top 6": Brown SAND, little Silt, trace fine Gravel. Bottom 6": Brown SILT, some Sand, little Gravel.	None	Wet	ND	None	SB-5 (12) SB-5 (11-13)
14 15	10"		Dark brown SAND, some Silt, trace fine Gravel.	None	Wet	ND	None	
16 17	22"		Dark brown SAND, little Silt.	None	Wet	ND	None	

Notes: Groundwater encountered at approximately 11' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector

NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-5(10-11), SB-5(11), SB-5(12) and SB-5(11-13) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270)

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-5**
Sheet 2 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 13:15 **Finish Time** 15:00
Date: 4/13/2010
Weather: Sunny, Clear; 70F

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
18 - 19	20"		Top 8": Dark gray SILT, some Sand, trace fine Gravel. Bottom 12": Brown SAND, little Silt, trace fine Gravel.	None	Wet	ND	None	
20 - 21	24"		Brown SAND, little Silt, trace fine Gravel.	None	Wet	ND	None	
22 - 34			End of boring at 21' below ground surface.					

Notes: Groundwater encountered at approximately 11' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-5(10-11), SB-5(11), SB-5(12) and SB-5(11-13) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-6**
Sheet 1 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 10:50 **Finish Time** 12:00
Date: 4/12/2010
Weather: Sunny + Clear, ~65F

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1 2 3 4 5			Hand cleared to 5-feet below ground surface (bgs). Cuttings consisted of black/brown SAND, trace Concrete.	None	Dry	ND	None	
6 7	15"	2 3 3 2	Light brown, SAND and SILT, trace Gravel (concrete).	None	Dry	ND	None	
8 9	10"		Light brown, SAND and SILT, trace Gravel (concrete).	None	Dry	ND	None	
10 11	18"	2 5 7 21	Top 15":Light brown SILT, little Sand, trace fine Gravel. Bottom 3": Dark brown/gray SILT, some Sand.	None None	Dry Moist	ND ND	None None	SB-6 (9-11) SB-6 (11)
12 13	12"		Top 5": Dark brown/gray SILT, some Sand, trace fine Gravel. Bottom 7": Brown loose SAND, trace Silt.	None None	Moist Wet	ND ND	None None	
14 15	7"	5 5 7 7	Dark gray SAND and SILT, little Gravel.	None	Wet	ND	None	
16 17	24	4 6 8 10	Top 12": Dark gray SAND, little Silt. Bottom 12": Gray/brown SAND, some Silt.	None Mild petrol-like	Wet Wet	ND 3.0	None None	SB-6 (16-17) SB-6 (17)

Notes: Groundwater encountered at approximately 11' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-6(9-11), SB-6(11), SB-6(17) and SB-6(16-17) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270)

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-6**
Sheet 2 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 10:50 **Finish Time** 12:00
Date: 4/13/2010
Weather: Sunny, Clear; 70F

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
18	24"		Top 18": Dark brown/gray SAND, little Silt.	None	Wet	ND	None	
19			Bottom 6": Gray SAND, some Silt.					
20	24"		Top 8": Dark brown/gray SAND, little Silt.	None	Wet	ND	None	
21			Bottom 16": Dark gray SAND, little Silt.	None	Wet	1.0	None	
22			End of boring at 21' below ground surface.					
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								

Notes: Groundwater encountered at approximately 11' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-6(9-11), SB-6(11), SB-6(17) and SB-6(16-17) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-7**
Sheet 1 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 10:35 **Finish Time** 12:00
Date: 4/13/2010
Weather: Cloudy, clear, ~55F

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1 2 3 4 5			Hand cleared to 5-feet below ground surface (bgs). Cuttings consisted of dark brown SAND and SILT.	None	Dry	ND	None	
6 7	11"		Dark brown SAND and SILT, little Gravel.	None	Dry	ND	None	
8 9	12"		Dark brown SILT, some Sand, trace fine Gravel.	None	Wet	ND	None	SB-7 (7-8) SB-7 (8)
10 11	11"		Dark brown SILT and SAND.	None	Wet	ND	None	SB-7 (9) SB-7 (9-11)
12 13	19"		Top 8": Dark brown SILT and SAND. Bottom 11": Red-brown SAND and SILT.	None	Wet	ND	None	
14 15			Top 4": Dark brown SILT, some Sand. Bottom 14": Red-brown SILT and SAND.	None	Wet	ND	None	
16 17	24"		Red-brown SAND, some Silt.	None	Wet	ND	None	

Notes: Groundwater encountered at approximately 8' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-7(8), SB-7(7-8), SB-7(9) and SB-7(9-11) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270)

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-7**
Sheet 2 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 10:35 **Finish Time** 12:00
Date: 4/13/2010
Weather: Cloudy, clear, ~55F

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
18	0"		No Recovery.	NA	NA	NA	NA	
19								
20			End of boring at 19' below ground surface.					
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								

Notes: Groundwater encountered at approximately 8' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector

NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-7(8), SB-7(7-8), SB-7(9) and SB-7(9-11) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-8**
Sheet 1 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 10:35 **Finish Time** 12:00
Date: 4/13/2010
Weather: Cloudy, clear, ~55F

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1 2 3 4 5			Hand cleared to 5-feet below ground surface (bgs). Cuttings consisted of dark brown SAND and SILT, little Gravel (concrete).	None	Dry	ND	None	
6 7	7		Top 4": Dark brown SAND and SILT, little Gravel. Bottom 3": Yellow-brown SILT, little fine Gravel.	None	Dry	ND	None	
8 9	20		Top 17": Brown SILT, some Sand. Bottom 3": Light brown SILT, little Sand.	None	Dry	ND	None	SB-8 (7-9) SB-8 (9)
10 11	18		Top 2": Dark brown SAND and SILT, little fine Gravel. Bottom 16": Brown SAND and SILT.	None None	Moist Wet	ND ND	None None	SB-8 (10) SB-8 (10-11)
12 13	17		Brown SILT, some Sand.	None	Wet	ND	None	
14 15	17		Top 10": Brown SILT, some Sand. Middle 2": Yellow-brown SAND, little Silt. Bottom 5": Red-brown SILT, little Sand.	None	Wet	ND	None	
16 17	24		Red-brown SILT, some Sand, trace Gravel.	None	Wet	ND	None	

Notes: Groundwater encountered at approximately 10' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector
NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-8(7-9), SB-8(9), SB-8(10) and SB-8(10-11) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270)

SOIL BORING LOG

34 Berry Street
AKRF Project Number: 11259

Boring No. **SB-8**
Sheet 2 of 2

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Truck mounted Drill Rig
Sampling Method: 2-foot split spoon sampler
Driller : Aquifer Drilling and Testing (ADT)
Sampler: Eric Kutter

Drilling
Start Time 8:47 **Finish Time** 10:15
Date: 4/13/2010
Weather: Cloudy, clear, ~55F

Depth (feet)	Recovery (Inches)	Blow Count	Surface Condition: 3" CONCRETE (Sidewalk)	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
18	24"		Red-brown SILT, little Sand, trace fine Gravel.	None	Wet	ND	None	
19								
20			Red-brown SAND and SILT, trace fine Gravel.	None	Wet	ND	None	
21								
22			End of boring at 21' below ground surface.					
23								
24								
25								
26								
27								
28								
29								
30								
31								
32								
33								
34								

Notes: Groundwater encountered at approximately 10' below ground surface.

ND- Not detected. **NA-** Not applicable. **PID-** Photoionization Detector

NAPL- Non-Aqueous Phase Liquids **PPM-** parts per million

Samples SB-8(7-9), SB-8(9), SB-8(10) and SB-8(10-11) were collected and sent to laboratory for analysis for Target Compound List (TCL) Volatile Organic Compounds (VOCs) (8260) and TCL Semi-Volatile Organic Compounds (SVOCs) (8270).

	34 Berry Street		**Well No. MW-8**
	AKRF Project Number : 11259		**Sheet 1 of 1**
	Drilling Method:	Hollow Stem Auger	**Drilling**
	Sampling Method:	2-foot Split Spoon	**Start** / **Finish**
	Driller :	Aquifer Drilling and Testing (ADT)	**Time: NR** / **Time: NR**
	TOC Elevation:		**Date: 3/5/10** / **Date: 3/5/10**
	Logged by:	Andrew Gasparo (Landmark)	

Depth (feet)	Well Construction	Construction Description
1		**Flush mounted well cover with locking cap at surface**
2		
3		**Bentonite/Cement Grout ~0'-9.5'**
4		
5		
6		
7		**2-inch diameter PVC riser installed ~0'-12'**
8		
9		
10		
9		
10		
11		
12		**Sand pack filter ~9.5'-22.5'**
13		
14		
15		
16		
17		**2-inch diameter PVC 0.02-slot screen ~11.5'-21.5'**
18		
19		
20		
21		
22		
23		**PVC sump ~21.5'-22.5'**
24		
25		

Notes: Log constructed based on total well depth measured during well development and information provided by Andrew Gasparo of Landmark Consulting.

	34 Berry Street		**Well No. MW-9**
	AKRF Project Number : 11259		**Sheet 1 of 1**
	Drilling Method:	Hollow Stem Auger	**Drilling**
	Sampling Method:	2-foot Split Spoon	**Start** / **Finish**
	Driller :	Aquifer Drilling and Testing (ADT)	**Time: NR** / **Time: NR**
	TOC Elevation:		**Date: 3/5/10** / **Date: 3/5/10**
	Logged by:	Andrew Gasparo (Landmark)	

Depth (feet)	Well Construction	Construction Description
1		**Flush mounted well cover with locking cap at surface**
2		
3		**Bentonite/Cement Grout ~0'-10'**
4		
5		
6		
7		**2-inch diameter PVC riser installed ~0'-12'**
8		
9		
10		
9		
10		
11		
12		**Sand pack filter ~10'-23'**
13		
14		
15		
16		
17		**2-inch diameter PVC 0.02-slot screen ~12'-22'**
18		
19		
20		
21		
22		
23		**PVC sump ~22'-23'**
24		
25		

Notes: Log constructed based on total well depth measured during well development and information provided by Andrew Gasparo of Landmark Consulting.

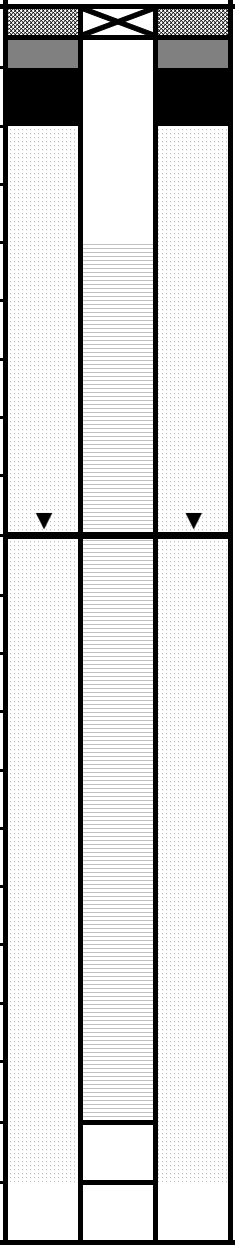
	34 Berry Street		**Well No. MW-10**
	AKRF Project Number : 11259		**Sheet 1 of 1**
	Drilling Method:	Hollow Stem Auger	**Drilling**
	Sampling Method:	2-foot Split Spoon	**Start** / **Finish**
	Driller :	Aquifer Drilling and Testing (ADT)	**Time: NR** / **Time: NR**
	TOC Elevation:		**Date: 3/5/10** / **Date: 3/5/10**
	Logged by:	Andrew Gasparo (Landmark)	

Depth (feet)	Well Construction	Construction Description
1		**Flush mounted well cover with locking cap at surface**
2		
3		**Bentonite/Cement Grout ~0'-12'**
4		
5		
6		
7		**2-inch diameter PVC riser installed ~0'-14'**
8		
9		
10		
9		
10		
11		
12		
13		
14		
15		**Sand pack filter ~12'-25'**
16		
17		
18		
19		
20		**2-inch diameter PVC 0.02-slot screen ~14'-24'**
21		
22		
23		
24		
25		**PVC sump ~24'-25'**

Notes: Log constructed based on total well depth measured during well development and information provided by Andrew Gasparo of Landmark Consulting.

AKRF	34 Berry Street AKRF Project Number : 11259	Well No. MW-11 Sheet 1 of 1

Engineering P.C. 440 Park Avenue South, 7th Floor New York, NY 10016			Drilling	
	Drilling Method:	Hollow Stem Auger	Start	Finish
	Sampling Method:	2-foot Split Spoon	Time: 1305	Time: 1545
	Driller :	Aquifer Drilling and Testing (ADT)	Date: 4/13/10	Date: 4/13/10
	TOC Elevation:			
	Logged by:	Eric Kutter		

Depth (feet)	Well Construction	Construction Description
1		Flush mounted well cover with locking cap at surface Cement grout 0'-1'
2		Bentonite seal 1'-2'
3		
4		2-inch diameter PVC riser installed 0'-4'
5		Sand pack filter 2'-20'
6		
7		2-inch diameter PVC 0.02-slot screen 4'-19'
8		
9		Groundwater at approximately 9'
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		PVC sump 19'-20'
21		

Notes:
Groundwater apparent at 9'

AKRF	34 Berry Street AKRF Project Number : 11259		Well No. MW-12 Sheet 1 of 1	
Engineering P.C. 440 Park Avenue South, 7th Floor New York, NY 10016	Drilling Method:	Hollow Stem Auger	Drilling	
	Sampling Method:	2-foot Split Spoon	Start	Finish
	Driller :	Aquifer Drilling and Testing (ADT)	Time: 1315	Time: 1500
	TOC Elevation:		Date: 4/12/10	Date: 4/12/10
	Logged by:	Eric Kutter		

Depth (feet)	Well Construction	Construction Description
1		Flush mounted well cover with locking cap at surface
2		Cement grout 0'-2'
3		Bentonite seal 2'-4'
4		
5		2-inch diameter PVC riser installed 0'-6'
6		
7		Sand pack filter 4'-22'
8		
9		2-inch diameter PVC 0.02-slot screen 6'-21'
10		
9		
10		
11	▼ ▼	Groundwater at approximately 11'
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		PVC sump 21'-22'
23		

Notes:
Groundwater apparent at 9'

AKRF	34 Berry Street AKRF Project Number : 11259		Well No. MW-13 Sheet 1 of 1	
Engineering P.C. 440 Park Avenue South, 7th Floor New York, NY 10016	Drilling Method:	Hollow Stem Auger	Drilling	
	Sampling Method:	2-foot Split Spoon	Start	Finish
	Driller :	Aquifer Drilling and Testing (ADT)	Time: 1050	Time: 1205
	TOC Elevation:		Date: 4/12/10	Date: 4/12/10
	Logged by:	Eric Kutter		

Depth (feet)	Well Construction	Construction Description
1		Flush mounted well cover with locking cap at surface
2		Cement grout 0'-2'
3		Bentonite seal 2'-4'
4		
5		2-inch diameter PVC riser installed 0'-6'
6		
7		Sand pack filter 4'-22'
8		
9		2-inch diameter PVC 0.02-slot screen 6'-21'
10		
9		
10		
11	▼ ▼	Groundwater at approximately 11'
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		PVC sump 21'-22'
23		

Notes:
Groundwater apparent at 9'

AKRF	34 Berry Street AKRF Project Number : 11259	Well No. MW-14 Sheet 1 of 1

Engineering P.C. 440 Park Avenue South, 7th Floor New York, NY 10016			Drilling	
	Drilling Method:	Hollow Stem Auger	Start	Finish
	Sampling Method:	2-foot Split Spoon	Time: 1035	Time: 1200
	Driller :	Aquifer Drilling and Testing (ADT)	Date: 4/13/10	Date: 4/13/10
	TOC Elevation:			
	Logged by:	Eric Kutter		

Depth (feet)	Well Construction	Construction Description: Flush mounted well cover with locking cap at surface
1		Cement grout 0'-0.5'
		Bentonite seal 0.5'-1'
2		
3		2-inch diameter PVC riser installed 0'-3'
4		Sand pack filter 1'-19'
5		
6		
7		2-inch diameter PVC 0.02-slot screen 3'-18'
8	▼ ▼	Groundwater at approximately 8'
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		PVC sump 18'-19'
20		

Notes:
Groundwater apparent at 8'

AKRF	34 Berry Street AKRF Project Number : 11259	Well No. MW-15 Sheet 1 of 1

Engineering P.C. 440 Park Avenue South, 7th Floor New York, NY 10016			Drilling	
	Drilling Method:	Hollow Stem Auger	Start	Finish
	Sampling Method:	2-foot Split Spoon	Time: 0847	Time: 1015
	Driller :	Aquifer Drilling and Testing (ADT)	Date: 4/13/10	Date: 4/13/10
	TOC Elevation:			
	Logged by:	Eric Kutter		

Depth (feet)	Well Construction	Construction Description
1		Flush mounted well cover with locking cap at surface
		Cement grout 0'-1'
2		
3		Bentonite seal 1'-3'
4		2-inch diameter PVC riser installed 0'-5'
5		
6		
7		Sand pack filter 3'-21'
8		
9		2-inch diameter PVC 0.02-slot screen 5'-20'
10	▼ ▼	Groundwater at approximately 10'
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		PVC sump 20'-21'
22		

Notes:
Groundwater apparent at 10'

SOIL BORING LOG

Date 4-9-2013

DESCRIPTION MW-18 **LOGGED BY** Michael Marsicano

LOCATION 34 Berry Street, Brooklyn NY

BORING NO. MW-18 **DRILLING METHOD** Auger **HAMMER TYPE** G-60

Surface Water Elev. NA (ft.) Groundwater Elev. First Encounter 11 (ft.) Upon Completion (ft.) After ____ Hrs. ____ (ft.) **SOIL DESCRIPTION**	**Notes**	**Depth** (ft.)	**Density** (blows)	**PID** (ppm)	**Moisture** (%)
Concrete Surface – 12'' - Brown sandy loam				0.0	
12" recovery -		-1			
12'' - Brown sandy fill material					
		-2		0.0	
				0.0	
12'' – light brown fine sandy loam		-3			
		-4			
12'' – light brown fine sandy loam				0.0	
30" recovery		-5			
18'' – Yellowish brown fine and medium sands		-6		0.0	
		-7			
		-8			
48" – Light brown medium and medium-coarse sands				0.0	
48" recovery		-9			
		-10		0.0	
Sample collected at ~10' below grade – above saturated soil – Within the fine and medium sands		-11			
		-12		0.0	
48" – Light brown Sandy loam with common distinct redox features. Soil is wet. Sample collected at ~12' below grade, below the top of the saturated zone.		-13			
48" recovery				0.0	100%
		-14			
		-15			
		-16			
48'' – Yellowish brown loamy sand with many prominent redoxymorphic features. Soil is saturated. Yellowish brown loamy sand continues to 25' bgs.				0.0	
48" recovery		-17			
		-18		0.0	
		-19			
		-20			

SOIL BORING LOG

Date 4-9-2013

DESCRIPTION MW-19 **LOGGED BY** Michael Marsicano

LOCATION 34 Berry Street, Brooklyn NY

BORING NO. MW-19 **DRILLING METHOD** Auger **HAMMER TYPE** G-60

Surface Water Elev. NA (ft.) Groundwater Elev. First Encounter 11 (ft.) Upon Completion (ft.) After ___ Hrs. ___ (ft.) **SOIL DESCRIPTION**	**Notes**	**Depth** (ft.)	**Density** (blows)	**PID** (ppm)	**Moisture** (%)
				0.0	
		-1			
Concrete Surface – 12'' - Brown sandy loam and fill					
24" recovery -		-1		0.0	
12'' - Brown sandy fill material				0.0	
		-2			
		-3			
				0.0	
		-4			
18'' – light brown sandy loam					
18" recovery		-5		0.0	
				0.0	
		-6			
		-7			
				0.0	
		-8			
42" – Light brown medium and medium-coarse sands					
42" recovery		-9		0.0	
		-10			
Sample collected at ~10' below grade – above saturated soil – Within the medium sands		-11		0.0	
		-12			
36" – Light brown Sandy loam with common distinct redox features. Soil is wet. Sample collected at ~12' below grade, below the top of the saturated zone.				0.0	
36" recovery		-13			100%
		-14			
		-15			
		-16			
36'' – Yellowish brown loamy sand with many prominent redoxymorphic features. Soil is saturated.					
36" recovery		-17			
		-19			
* Refusal at 20' bgs.					
		-20			

SOIL BORING LOG

Date 4-22-2013

DESCRIPTION MW-17 **LOGGED BY** Michael Marsicano

LOCATION 34 Berry Street

BORING NO. MW-20 **DRILLING METHOD** Auger **HAMMER TYPE** G-60

Surface Water Elev. NA (ft.)	Notes	Depth	Density	PID	Moisture
Groundwater Elev.					
First Encounter 10.5 (ft.)					
Upon Completion (ft.)					
After ____ Hrs. ____ (ft.)					
SOIL DESCRIPTION		(ft.)	(blows)	(ppm)	(%)
				0.0	
		-1			
	Concrete Surface – 18'' - Brown sandy loam and fill	-2		0.0	
18" recovery -				0.0	
		-3			
		-4			
				0.0	
		-5			
	24'' – light yellowish brown coarse sandy loam	-6		0.0	
24" recovery					
		-7			
		-8			
				0.0	
		-9			
	36" – Light brown medium and medium-coarse sands	-10		0.0	
36" recovery					
		-11			
	Sample collected at ~9' below grade – above saturated soil – Within the medium sands	-12			100%
		-13			
	48" – Light brown Sandy loam with prominent distinct redox features. Soil is wet. Sample collected at ~12' below below grade, below the top of the saturated zone.	-14			
48" recovery		-15			
		-16			
		-17			
	36'' – Yellowish brown loamy sand with many prominent redoxymorphic features. Soil is saturated.	-18			
36" recovery					
		-19			
	* Refusal at 19' bgs	-20			

WELL DEVELOPMENT RECORD

Project Name: 34 Berry Street

Location: 34 Berry Street | Personnel: Michael Marsicano/Paul McGaha | Date (Start/End): April 29, 2013

Well/Piez. No.: MW-18 | Date Installed: April 9, 2013 | Csg. Diameter (I.D.): _____

Method of Development: Submersible Whale with Horiba | Total Depth (ft. TOC): _____

☐ Surging ☐ Bailing ☐ Pumping | Development Date: April 29, 2013

☑ Original Development ☐ Redevelopment ☐ Other (State Method)

Depth to water before developing well (TOC): 11.0' | Depth to bottom before developing well (TOC): 25

	Volume (V)		Purge Factor		Volume To Purge
Height of Water Column:	14 feet x	gal/ft =		gal. *	= gal.

$V = (B*r_c^2*L_c*7.48) + (B*(r_w-r_c)^2*L_s*ø_s*7.48)$= _____ gallons (See Notes below)

Depth purging from: _____ feet | Time purging begins: _____ | Weather: (°F),

Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter _____ | SC Meter _____ | Turbidity Meter Horiba

Equipment decontaminated prior to development Y ____ N ____ Describe: _____

Date	Time	Purge Rate (gal/min)	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F)	pH +/- 0.1	Specific Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/l or %)	Oxidation Reduction Potential (mV) +/- 10 mV	Comments
4/29/13	10:00	1.33	11.0'	0	NA	NA	NA	56	NA	NA	
4/29/13	10:05	1.33	NA	6.65	NA	NA	NA	46	NA	NA	
4/29/13	10:10	1.33	NA	13.3	NA	NA	NA	33	NA	NA	
4/29/13	10:15	1.33	NA	19.95	NA	NA	NA	25	NA	NA	
4/29/13	10:20	1.33	NA	26.6	NA	NA	NA	17	NA	NA	
4/29/13	10:25	1.33	NA	33.25	NA	NA	NA	7	NA	NA	
4/29/13	10:30	1.33	NA	39.95	NA	NA	NA	3	NA	NA	

Notes:

- Water Levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to .01 pH units
- Specific conductivity (SC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @ 25 C or in mS/cm of instrument set range
- Water Temperature – Reported to the nearest 0.1 C or F
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTU nearest whole #

Where:

B = 3.14

$Ø_s$ = porosity of the sand pack

r_c = radius of the well casing and screen in feet

L_c = length of water column inside the casing and screen in feet

r_w = radius of the well bore in feet

L_s = length of saturated portion of the sand pack in feet

7.48 gallons / cubic foot = conversion from cubic feet to gallons

WELL CONSTRUCTION RECORD

SITE: 34 Berry Street County: _____ Well #: MW-18

Site Name: 34 Berry Street Grid Coordinates: Northing _____ Easting _____

Drilling Contractor: _____ Date Drilling Started: 4-9-2013

Driller: _____ Geologist: MM Date Drilling Ended: 4-9-2013

Drilling Method: Auger Drilling Fluid Type: _____

ANNULAR SPACE DETAILS:

Type of Surface Seal: _____

Amount of Surface Seal: # of Bags _____ lbs per Bag _____

Type of Annular Sealant: _____

Amount of Annular Seal: # of Bags _____ lbs per Bag _____

Type of Filter Pack: _____

Amount of Filter Pack: # of Bags _____ lbs per Bag _____

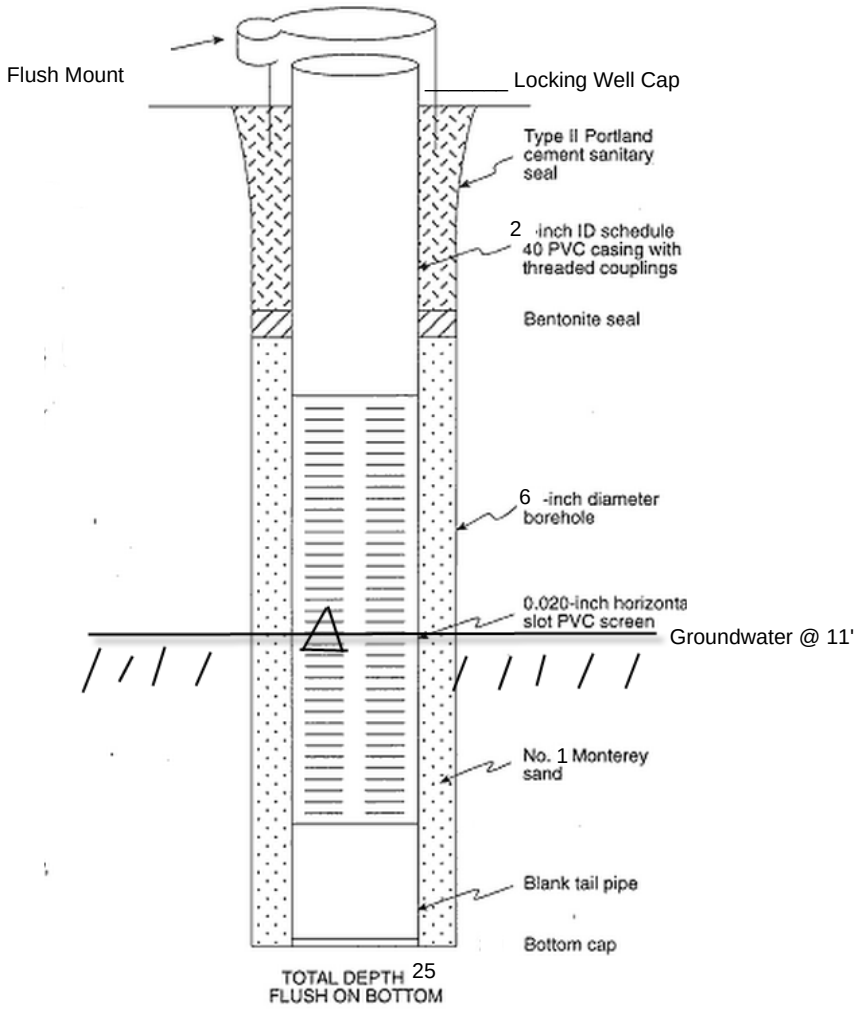
WELL CONSTRUCTION MATERIALS:

Date of Construction: 4-9-13	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser Coupling			X	
Riser Pipe Above WT			X	
Riser Pipe Below WT				
Screen Coupling			X	
Screen			X	
Surface Casing	X			
Protective Casing	X			

MEASUREMENTS: To 0.01 ft. (where applicable)

Dimensions of Bore Hole	2" X 25'
Dimensions of Surface Casing	
Riser Pipe Length	8'
ID of Riser Pipe	
Top of Screen to First Joint	
Screen Length	16'
Screen Slot Size	
Number of Openings in Screen	
Bottom of Screen to End Cap	1'
Dimensions of Protective Casing	

CONSTRUCTION DETAILS



WELL DEVELOPMENT RECORD

Project Name: 34 Berry Street

Location: 34 Berry Street | Personnel: Michael Marsicano/Paul McGaha | Date (Start/End): April 29, 2013

Well/Piez. No.: MW-18 | Date Installed: April 9, 2013 | Csg. Diameter (I.D.): _____

Method of Development: Submersible Whale with Horiba | Total Depth (ft. TOC): _____

☐ Surging ☐ Bailing ☐ Pumping | Development Date: April 29, 2013

☑ Original Development ☐ Redevelopment ☐ Other (State Method)

Depth to water before developing well (TOC): 11.0' | Depth to bottom before developing well (TOC): 25

	Volume (V)		Purge Factor		Volume To Purge
Height of Water Column:	14 feet x	gal/ft =		gal. *	= gal.

$V = (B*r_c^2*L_c*7.48) + (B*(r_w-r_c)^2*L_s*ø_s*7.48)=$ _____ gallons (See Notes below)

Depth purging from: _____ feet | Time purging begins: _____ | Weather: (°F),

Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter _____ | SC Meter _____ | Turbidity Meter Horiba

Equipment decontaminated prior to development Y ____ N ____ Describe: _____

Date	Time	Purge Rate (gal/min)	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F)	pH +/- 0.1	Specific Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/l or %)	Oxidation Reduction Potential (mV) +/- 10 mV	Comments
4/29/13	10:00	1.33	11.0'	0	NA	NA	NA	56	NA	NA	
4/29/13	10:05	1.33	NA	6.65	NA	NA	NA	46	NA	NA	
4/29/13	10:10	1.33	NA	13.3	NA	NA	NA	33	NA	NA	
4/29/13	10:15	1.33	NA	19.95	NA	NA	NA	25	NA	NA	
4/29/13	10:20	1.33	NA	26.6	NA	NA	NA	17	NA	NA	
4/29/13	10:25	1.33	NA	33.25	NA	NA	NA	7	NA	NA	
4/29/13	10:30	1.33	NA	39.95	NA	NA	NA	3	NA	NA	

Notes:

- Water Levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to .01 pH units
- Specific conductivity (SC) – Reported to the nearest 10% mhos/cm or µmho/cm @ 25 C or in mS/cm of instrument set range
- Water Temperature – Reported to the nearest 0.1 C or F
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTU nearest whole #

Where:

B = 3.14

$Ø_s$ = porosity of the sand pack

r_c = radius of the well casing and screen in feet

L_c = length of water column inside the casing and screen in feet

r_w = radius of the well bore in feet

L_s = length of saturated portion of the sand pack in feet

7.48 gallons / cubic foot = conversion from cubic feet to gallons

WELL CONSTRUCTION RECORD

SITE: 34 Berry Street County: _____ Well #: MW-18

Site Name: 34 Berry Street Grid Coordinates: Northing _____ Easting _____

Drilling Contractor: _____ Date Drilling Started: 4-9-2013

Driller: _____ Geologist: MM Date Drilling Ended: 4-9-2013

Drilling Method: Auger Drilling Fluid Type: _____

ANNULAR SPACE DETAILS:

Type of Surface Seal: _____

Amount of Surface Seal: # of Bags _____ lbs per Bag _____

Type of Annular Sealant: _____

Amount of Annular Seal: # of Bags _____ lbs per Bag _____

Type of Filter Pack: _____

Amount of Filter Pack: # of Bags _____ lbs per Bag _____

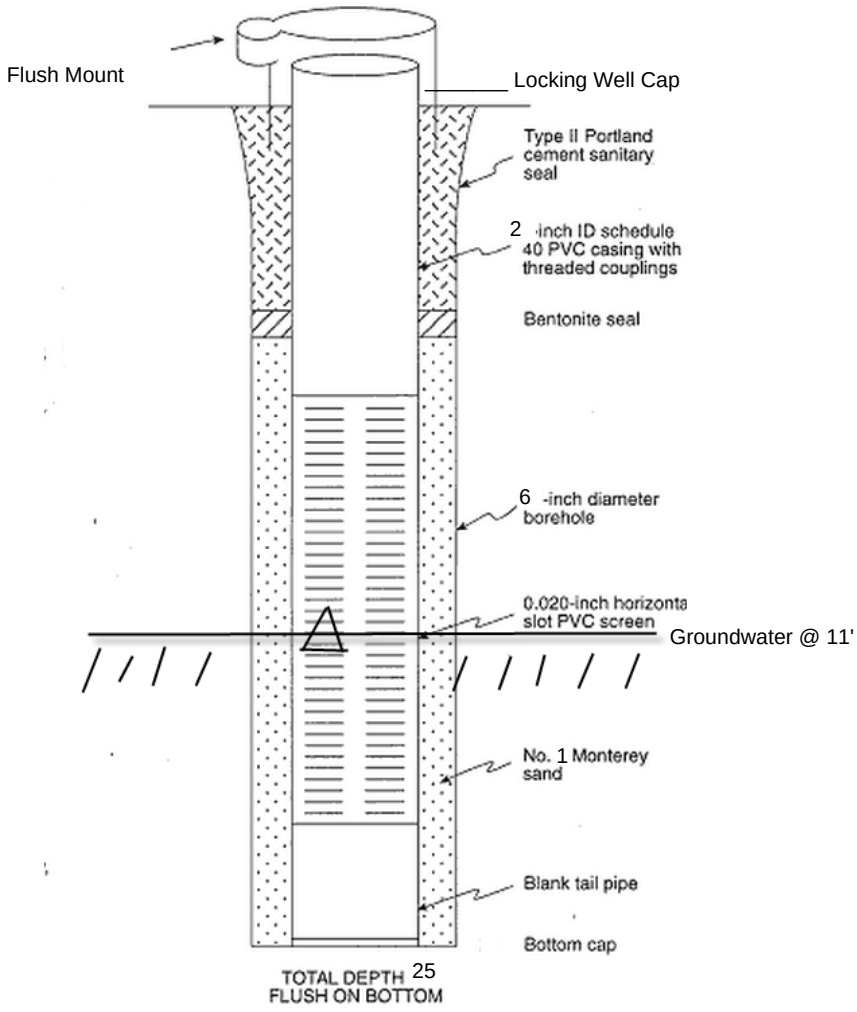
WELL CONSTRUCTION MATERIALS:

Date of Construction: 4-9-13	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser Coupling			X	
Riser Pipe Above WT			X	
Riser Pipe Below WT				
Screen Coupling			X	
Screen			X	
Surface Casing	X			
Protective Casing	X			

MEASUREMENTS: To 0.01 ft. (where applicable)

Dimensions of Bore Hole	2" X 25'
Dimensions of Surface Casing	
Riser Pipe Length	8'
ID of Riser Pipe	
Top of Screen to First Joint	
Screen Length	16'
Screen Slot Size	
Number of Openings in Screen	
Bottom of Screen to End Cap	1'
Dimensions of Protective Casing	

CONSTRUCTION DETAILS



WELL DEVELOPMENT RECORD

Project Name: 34 Berry Street

Location: 34 Berry Street | Personnel: Michael Marsicano/Paul McGaha | Date (Start/End): April 29, 2013

Well/Piez. No.: MW-18 | Date Installed: April 9, 2013 | Csg. Diameter (I.D.): _____

Method of Development: Submersible Whale with Horiba | Total Depth (ft. TOC): _____

☐ Surging ☐ Bailing ☐ Pumping | Development Date: April 29, 2013

☑ Original Development ☐ Redevelopment ☐ Other (State Method)

Depth to water before developing well (TOC): 11.0' | Depth to bottom before developing well (TOC): 25

	Volume (V)		Purge Factor		Volume To Purge
Height of Water Column:	14 feet x	gal/ft =		gal. *	= gal.

$V = (B*r_c^2*L_c*7.48) + (B*(r_w-r_c)^2*L_s*ø_s*7.48)$= _____ gallons (See Notes below)

Depth purging from: _____ feet | Time purging begins: _____ | Weather: (°F),

Screened Interval (ft. BGL): _____

Equipment Nos.: pH Meter _____ | SC Meter _____ | Turbidity Meter Horiba

Equipment decontaminated prior to development Y ____ N ____ Describe: _____

Date	Time	Purge Rate (gal/min)	Water Level (ft. below TOC)	Volume Removed (gal.)	Temp (C or F)	pH +/- 0.1	Specific Conductivity (mS/cm)	Turbidity (NTU)	D.O. (mg/l or %)	Oxidation Reduction Potential (mV) +/- 10 mV	Comments
4/29/13	10:00	1.33	11.0'	0	NA	NA	NA	56	NA	NA	
4/29/13	10:05	1.33	NA	6.65	NA	NA	NA	46	NA	NA	
4/29/13	10:10	1.33	NA	13.3	NA	NA	NA	33	NA	NA	
4/29/13	10:15	1.33	NA	19.95	NA	NA	NA	25	NA	NA	
4/29/13	10:20	1.33	NA	26.6	NA	NA	NA	17	NA	NA	
4/29/13	10:25	1.33	NA	33.25	NA	NA	NA	7	NA	NA	
4/29/13	10:30	1.33	NA	39.95	NA	NA	NA	3	NA	NA	

Notes:

- Water Levels – Reported to the nearest 0.01 foot.
- pH – Reading rounded to .01 pH units
- Specific conductivity (SC) – Reported to the nearest 10% mhos/cm or
- µmho/cm @ 25 C or in mS/cm of instrument set range
- Water Temperature – Reported to the nearest 0.1 C or F
- Dissolved oxygen (D.O.) report in 0.1 mg/L
- Turbidity report in NTU nearest whole #

Where:

B = 3.14

$Ø_s$ = porosity of the sand pack

r_c = radius of the well casing and screen in feet

L_c = length of water column inside the casing and screen in feet

r_w = radius of the well bore in feet

L_s = length of saturated portion of the sand pack in feet

7.48 gallons / cubic foot = conversion from cubic feet to gallons

WELL CONSTRUCTION RECORD

SITE: 34 Berry Street County: _____ Well #: MW-18

Site Name: 34 Berry Street Grid Coordinates: Northing _____ Easting _____

Drilling Contractor: _____ Date Drilling Started: 4-9-2013

Driller: _____ Geologist: MM Date Drilling Ended: 4-9-2013

Drilling Method: Auger Drilling Fluid Type: _____

ANNULAR SPACE DETAILS:

Type of Surface Seal: _____

Amount of Surface Seal: # of Bags _____ lbs per Bag _____

Type of Annular Sealant: _____

Amount of Annular Seal: # of Bags _____ lbs per Bag _____

Type of Filter Pack: _____

Amount of Filter Pack: # of Bags _____ lbs per Bag _____

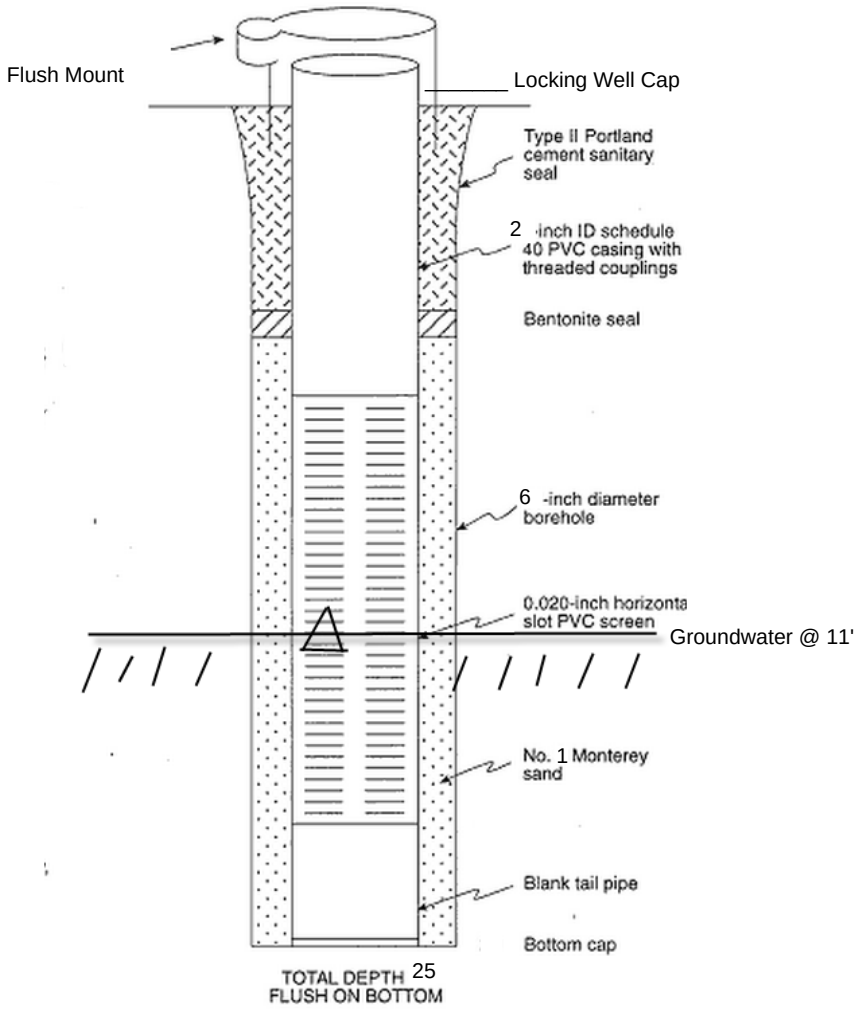
WELL CONSTRUCTION MATERIALS:

Date of Construction: 4-9-13	Stainless Steel Specify Type	Teflon Specify Type	PVC Specify Type	Other Specify Type
Riser Coupling			X	
Riser Pipe Above WT			X	
Riser Pipe Below WT				
Screen Coupling			X	
Screen			X	
Surface Casing	X			
Protective Casing	X			

MEASUREMENTS: To 0.01 ft. (where applicable)

Dimensions of Bore Hole	2" X 25'
Dimensions of Surface Casing	
Riser Pipe Length	8'
ID of Riser Pipe	
Top of Screen to First Joint	
Screen Length	16'
Screen Slot Size	
Number of Openings in Screen	
Bottom of Screen to End Cap	1'
Dimensions of Protective Casing	

CONSTRUCTION DETAILS



AKRF, Inc.

Environmental Cosultants

34 S. Broadway, Suite 401
White Plains, New York 10601

34 Berry - 34 Berry Street, Brooklyn, New York

AKRF Project Number : 11259

Well No. MW-20

Sheet 1 of 1

Drilling Method:	Hollow Stem Auger
Sampling Method:	DPP
Driller :	Aquifer Drilling and Testing (ADT)
TOC Elevation:	
Logged by:	Mark Jepsen

Drilling	
Start	**Finish**
Time: 10:05	**Time: 13:00**
Date: 6/17/16	

Depth (feet)	Well Construction	Construction Description
1		**Flush mounted well cover with locking cap at surface**
		Cement grout 0'-1'
2		**Bentonite seal 1'-2'**
3		
4		**2-inch diameter PVC riser installed 0'-10'**
5		**Sand pack filter 2'-20'**
6		
7		**2-inch diameter PVC 0.02-slot screen 10'-20'**
8		
9		
10		
11		
12		
13		
14	▼ ▼	**Groundwater at approximately 14'**
15		
16		
17		
18		
19		
20		

Notes:
Groundwater apparent at 14'

AKRF, Inc.

Environmental Cosultants

34 S. Broadway, Suite 401
White Plains, New York 10601

34 Berry - 34 Berry Street, Brooklyn, New York

AKRF Project Number : 11259

Well No. MW-21

Sheet 1 of 1

Drilling Method:	Hollow Stem Auger
Sampling Method:	DPP
Driller :	Aquifer Drilling and Testing (ADT)
TOC Elevation:	
Logged by:	Mark Jepsen

Drilling	
Start	**Finish**
Time: 12:20	**Time: 13:00**
Date: 6/14/16	

Depth (feet)	Well Construction	Construction Description
1		**Flush mounted well cover with locking cap at surface**
		Cement grout 0'-1'
2		**Bentonite seal 1'-2'**
3		
4		**2-inch diameter PVC riser installed 0'-9'**
5		**Sand pack filter 2'-19'**
6		
7		**2-inch diameter PVC 0.02-slot screen 9'-19'**
8		
9		
10		
11		
12		
13		
14		**Groundwater at approximately 15'**
15	▼ ▼	
16		
17		
18		
19		

Notes:
Groundwater apparent at 15'

AKRF, Inc.

Environmental Cosultants

34 S. Broadway, Suite 401
White Plains, New York 10601

34 Berry - 34 Berry Street, Brooklyn, New York

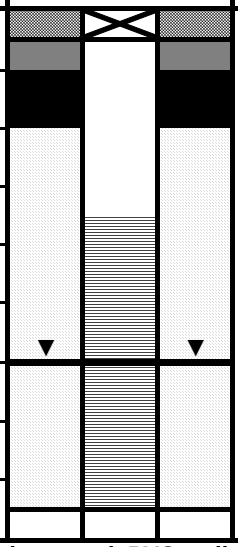
AKRF Project Number : 11259

Well No. MW-22

Sheet 1 of 1

Drilling Method:	Geoprobe
Sampling Method:	DPP
Driller :	Aquifer Drilling and Testing (ADT)
TOC Elevation:	
Logged by:	Mark Jepsen

Drilling	
Start	**Finish**
Time: 12:00	**Time: 12:40**
Date: 6/17/16	

Depth (feet)	**Well Construction**	**Construction Description**
1		**Flush mounted well cover with locking cap at surface**
2		**Cement grout 0'-1'**
3		**Bentonite seal 1'-2'**
4		**1-inch diameter prepacked PVC screen installed 3.5'-8.5'**
5		
6		**Groundwater at approximately 6'**
7		
8		
9		

Notes: 1 inch prepack PVC well used due to refusal issue with Geoprobe drill rig.
Groundwater apparent at 6'

AKRF, Inc.

Environmental Cosultants

34 S. Broadway, Suite 401
White Plains, New York 10601

34 Berry - 34 Berry Street, Brooklyn, New York

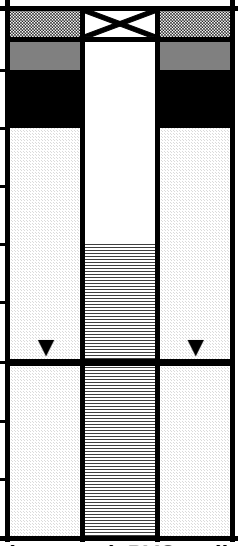
AKRF Project Number : 11259

Well No. MW-23

Sheet 1 of 1

Drilling Method:	Geoprobe
Sampling Method:	DPP
Driller :	Aquifer Drilling and Testing (ADT)
TOC Elevation:	
Logged by:	Mark Jepsen

Drilling	
Start	**Finish**
Time: 14:00	**Time: 14:30**
Date: 6/15/16	

Depth (feet)	**Well Construction**	**Construction Description**
1		**Flush mounted well cover with locking cap at surface**
2		**Cement grout 0'-1'**
3		**Bentonite seal 1'-2'**
4		**1-inch diameter prepacked PVC screen installed 4'-9'**
5		
6		**Groundwater at approximately 6'**
7		
8		
9		

Notes: 1 inch prepack PVC well used due to refusal issue with Geoprobe drill rig.
Groundwater apparent at 6'

AKRF, Inc.

Environmental Cosultants

34 S. Broadway, Suite 401
White Plains, New York 10601

34 Berry - 34 Berry Street, Brooklyn, New York

AKRF Project Number : 11259

Well No. MW-24

Sheet 1 of 1

Drilling Method:	3" Casing Driving
Sampling Method:	DPP
Driller :	Aquifer Drilling and Testing (ADT)
TOC Elevation:	
Logged by:	Mark Jepsen

Drilling	
Start	**Finish**
Time: 10:00	**Time: 10:55**
Date: 6/15/16	

Depth (feet)	**Well Construction**	**Construction Description**
1		**Flush mounted well cover with locking cap at surface**
		Cement grout 0'-1'
2		**Bentonite seal 1'-2'**
3		**2-inch diameter PVC riser installed 0'-3.5'**
4		**Sand pack filter 2'-8.5'**
5	▼	**Groundwater at approximately 5.5'**
6		**2-inch diameter PVC 0.02-slot screen 3.5'-8.5'**
7		
8		
9		

Notes:
Groundwater apparent at 5.5'

SOIL BORING LOG

34 Berry Street

AKRF Project Number: 11259

Boring No. **MW- 20**

Sheet 1 of 1

AKRF
440 Park Avenue South, New York, NY
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Geoprobe
Sampling Method: 5' Macrocore/Hand Auger
Driller : ADT
Sampler: Mark Jepsen

Drilling
Start Time 8:45 **Finish Time** 10:00
Date 6/17/2016
Weather: 70 °F, Sunny

Depth (feet)	Recovery (Inches)	Surface Condition: Concrete	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1	NA	Top 4": CONRETE.	None	Dry	ND	ND	
2							
3		Remaining: Fine Brown SAND, little Silt, Gravel trace Brick (FILL).	None	Dry	ND	ND	
4							
5							
6	32	Top 5": SLOUGH from above.	ND	Dry	ND	ND	
7							
8		Bottom 27": Fine Brown SAND, trace Silt, Gravel (FILL).	ND	Dry	ND	ND	
9							
10							
11	38						
12		Brown SAND, trace Silt, Gravel (FILL).	ND	Dry	ND	ND	MW-20 (11-13)
13							
14				Wet			
15							
16	60						
17		Top 45": Fine Brown SAND.	ND	Wet	ND	ND	
18		Bottom 15": Light Brown CLAY, some fine brown Sand.	ND	Wet	ND	ND	
19							
20							

Notes: End of boring at 20 feet below ground surface. First 5 feet of boring was handcleared with auger.
Groundwater encountered at 14 feet below grade.
PID = photoionization detector ppm = parts per million ND = Not Detected NAPL = Non-aqueous phase liquid

SOIL BORING LOG

34 Berry Street

AKRF Project Number: 11259

Boring No. **MW- 21**

Sheet 1 of 1

AKRF
440 Park Avenue South, New York, NY 10016
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method: Geoprobe
Sampling Method: 5' Macrocore/Hand Auger
Driller : ADT
Sampler: Mark Jepsen

Drilling
Start Time 11:52 **Finish Time** 12:15
Date 6/14/2016
Weather: 79 °F, Sunny

Depth (feet)	Recovery (Inches)	Surface Condition: Concrete	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1	42	Top 4": CONRETE.	None	Dry	ND	ND	
2		Bottom 38": Fine Brown SAND, little Silt (FILL).	None	Dry	ND	ND	
3							
4							
5							
6	46	Fine Brown SAND, trace Gravel (FILL).	ND	Dry	ND	ND	
7							
8							
9							
10							
11	52	Fine Brown SAND, little Clay, trace Gravel (FILL).	ND	Dry	ND	ND	
12							
13							
14							MW-21 (13-15)
15				Wet			
16	60	Top 10": SLOUGH from above.	ND	Wet	ND	ND	
17							
18		Bottom 50": Fine Brown SAND, little Clay, trace Gravel (FILL).	ND	Wet	ND	ND	
19							
20		End of boring at 19 feet below grade due to macrocore refusal.					

Notes: Refusal at 19 feet below ground surface.
Groundwater encountered at 15 feet below grade.
PID = photoionization detector ppm = parts per million ND = Not Detected NAPL = Non-aqueous phase liquid

SOIL BORING LOG

34 Berry Street

AKRF Project Number: 11259

Boring No. **MW-22**

Sheet 1 of 1

AKRF
440 Park Avenue South, New York, NY
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	**Geoprobe**
Sampling Method:	**3' Macrocore**
Driller :	ADT
Sampler:	Mark Jepsen

Drilling

Start Time	8:10	**Finish Time**	8:40
Date	6/16/2016		
Weather:	70 °F, Sunny		

Depth (feet)	Recovery (Inches)	Surface Condition: Concrete	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1	20	Top 5": CONCRETE.	ND	Dry	ND	ND	
2		Bottom 15": Brown SAND, trace Gravel (FILL).	ND	Dry	ND	ND	
3							
4	36	Top 8": SLOUGH from above.	ND	Dry	ND	ND	
5		Bottom 28": Brown SAND, little Silt, trace Gravel (FILL).	ND	Dry	ND	ND	MW-22 (4-6)
6							MW-32 (4-6)
7	36	Top 4": SLOUGH from above.	ND	Wet	ND	ND	
8		Bottom 32": Brown SAND, trace Silt (FILL).	ND	Wet	ND	ND	
9							
10		End of boring at 9 feet below basement grade due to macrocore refusal.					
11							
12							

Notes: End of boring at 9 feet below ground surface.

Groundwater encountered at 6 feet below grade.

PID = photoionization detector ppm = parts per million ND = Not Detected NAPL = Non-aqueous phase liquid

SOIL BORING LOG

34 Berry Street

AKRF Project Number: 11259

Boring No. **MW-23**

Sheet 1 of 1

AKRF
440 Park Avenue South, New York, NY
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	**Geoprobe**
Sampling Method:	**3' Macrocore**
Driller :	ADT
Sampler:	Mark Jepsen

Drilling

Start Time	1:05	**Finish Time**	1:35
Date	6/17/2016		
Weather:	70 °F, Sunny		

Depth (feet)	Recovery (Inches)	Surface Condition: Concrete	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1	20	Top 6": CONCRETE.	ND	Dry	ND	ND	
2		Bottom 14": Brown SAND, trace Gravel (FILL).	ND	Dry	ND	ND	
3							
4	26	Top 6": SLOUGH from above.	ND	Dry	ND	ND	
5		Bottom 20": Brown SAND, trace Gravel (FILL).	ND	Dry	ND	ND	MW-23 (4-6)
6							
7	36	Top 6": SLOUGH from above.	ND	Wet	ND 20.7	ND	MW-23 (6-8)
8							
9		Bottom 30": Dark Brown and Black SAND, little Clay.	Petro-like odor	Wet	30.4 20.4	Staining present	
10					29.4		
11		End of boring at 10 feet below basement grade due to macrocore refusal.					
12							

Notes: End of boring at 10 feet below ground surface.

Groundwater at 6 feet below grade.

PID = photoionization detector ppm = parts per million ND = Not Detected NAPL = Non-aqueous phase liquid

SOIL BORING LOG

34 Berry Street

AKRF Project Number: 11259

Boring No. **MW-24**

Sheet 1 of 1

AKRF
440 Park Avenue South, New York, NY
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	**Geoprobe**
Sampling Method:	**3' Macrocore**
Driller :	ADT
Sampler:	Mark Jepsen

Drilling

Start Time	8:05	**Finish Time**	9:55
Date	6/15/2016		
Weather:	74 °F, Sunny		

Depth (feet)	Recovery (Inches)	Surface Condition: Concrete	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1	17	Top 3": CONCRETE.	ND	Dry	9.1	ND	
2					10.9		
3		Bottom 14": Light Brown SAND, little Silt, trace Gravel (Fill).	ND	Dry	13.8	ND	
4	24	Top 14" Brown SAND, trace Gravel (FILL).	ND	Dry	20.8	ND	MW-24 (4-6)
5					40.2		
6		Bottom 10": Dark Brown to Black SAND, little dark brown Clay.	Petro-like odor	Wet	132	Staining present	
7	32	Dark Brown SAND, some Clay, trace Gravel (FILL).	Petro-like odor	Wet	113	Staining present	MW-24 (6-8)
8					153		
9					86		
10		End of boring at 9 feet below basement grade due to macrocore refusal.					
11							
12							

Notes: End of boring at 9 feet below ground surface.

Groundwater encountered at 6 feet below grade.

PID = photoionization detector ppm = parts per million ND = Not Detected NAPL = Non-aqueous phase liquid

SOIL BORING LOG

34 Berry Street

AKRF Project Number: 11259

Boring No. **SB-25**

Sheet 1 of 1

AKRF
440 Park Avenue South, New York, NY
Phone (212) 696-0670 Fax (212) 726-0942

Drilling Method:	**Geoprobe**
Sampling Method:	**3' Macrocore**
Driller :	ADT
Sampler:	Mark Jepsen

Drilling

Start Time	12:30	**Finish Time**	1:00
Date	6/15/2016		
Weather:	74 °F, Sunny		

Depth (feet)	Recovery (Inches)	Surface Condition: Concrete	Odor	Moisture	PID (ppm)	NAPL	Samples Collected for Lab Analysis
1	22	Top 6": CONCRETE.	ND	Dry	ND	ND	
2		Bottom 16": Fine Brown SAND, trace Gravel (FILL).	ND	Dry	ND	ND	
3							
4	34	Top 8" SLOUGH from above.	ND	Dry	ND	ND	SB-25 (3-5) SB-25 (3-5) MS SB-25 (3-5) MSD
5		Bottom 26": Fine Brown SAND, little Silt (FILL).	ND	Dry	ND	ND	
6							
7	36	Top 8": SLOUGH from above.	ND	Wet	ND	ND	
8		Bottom 28": Brown SAND, little Clay.	ND	Wet	ND	ND	
9							
10		End of boring at 8.5 feet below basement grade due to macrocore refusal.					
11							
12							

Notes: End of boring at 8.5 feet below ground surface.

Groundwater encountered at 6 feet below grade.

PID = photoionization detector ppm = parts per million ND = Not Detected NAPL = Non-aqueous phase liquid

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Extraction Well ID: Sheet 1 of 1	RW-01	Soil Boring ID:	RW-1

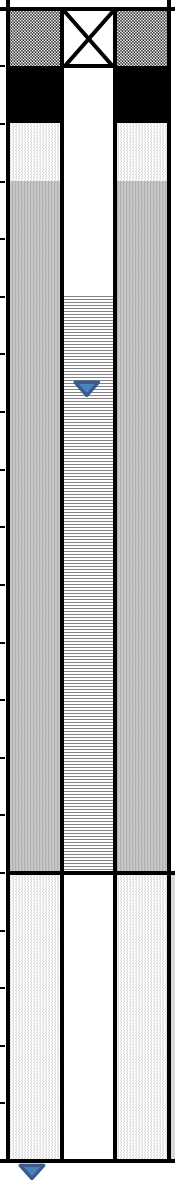
AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia
Sampling Method:	5' Macrocore
Driller:	ADT
Weather:	91° F , Sunny
Logged by:	M. Jepsen, AKRF

Drilling

Start Time: 12:20 (8/10/20) **Finish Time:** 12:30 (8/11/20)

Date: 8/10/2020 - 8/11/2020

Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1–20		**Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.** **4" diameter PVC well casing: grade to 5' below grade** **Grout seal: 1' to 2' below grade** **Bentonite seal: 2' to 3' below grade** **No. 00 morie sandpack filter: 3' to 4' below grade** **No. 2 morie sandpack filter: 4' to 15' below grade** **0.020-inch slotted Stainless Steel well screen: 5' to 15'** **End cap: 15' below grade**	48"	CONCRETE.	None	Dry	ND	ND	
			30"	Top 19": Dark Brown SAND, trace Silt, Gravel.	Petroleum-like odor	Dry	20.1	ND	"RW-1_5-7_20200811"
				Bottom 11": Black SAND, trace Silt, Gravel.	Petroleum-like odor	Wet	42.5	NAPL	
			50"	Top 25": Black SAND, some Silt, trace Gravel.	Strong petroleum-like odor	Wet	45.8	NAPL	
				Bottom 25": Brown SAND, trace Silt, Gravel.	Faint petroleum-like odor	Wet	33.3	ND	

Notes: **Groundwater Depth Indicator**

Groundwater was measured at 6.50 feet below basement grade.

Groundwater extraction well installed to 15 feet below basement grade.

Soil sample collected for: Part 375 Pesticides, Part 375 Herbicides, Part 375 Target Analyte List (TAL) Metals, polychlorinated biphenyls (PCBs), Mercury, Cyanide, 1,4-Dioxane, Per- and Polyfluoroalkyl subtances (PFAS) - standard 21 compound list.

Groundwater encountered at approximately 8 feet below basement grade during soil boring installation.

End of soil boring at 15 feet below basement grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Extraction Well ID: Sheet 1 of 1	RW-02	Soil Boring ID:	RW-2

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia
Sampling Method:	5' Macrocore/2' Split Spoon
Driller:	ADT
Weather:	81° F , Partly Cloudy
Logged by:	M. Jepsen, AKRF

Drilling

Start Time: 9:00 **Finish Time:** 11:25

Date: 8/12/2020

Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1		Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.	60"	Top 8": CONCRETE.	None	Dry	ND	ND	
2		4" diameter PVC well casing: grade to 4.5' below grade		Next 4": GRAVEL.	None	Dry	ND	ND	
3		Grout seal: 1' to 1.5' below grade		Next 25": Light Brown SAND, trace Silt, Gravel.	None	Dry	0.2	ND	
4		Bentonite seal: 1.5' to 2.5' below grade							
5				Bottom 23": Black SAND, trace Silt, Gravel.	Strong petroleum-like odor	Dry	51.3	NAPL	
6		No. 00 morie sandpack filter: 2.5' to 3.5' below grade	28"	Top 3": SLOUGH.	Faint petroleum-like odor	Dry	28.1	ND	"RW-2_5-7-_20200812"
7				Middle 21": Dark Brown SAND, trace Silt, Gravel.	Faint petroleum-like odor	Dry	49.4	NAPL	
8									
9		No. 2 morie sandpack filter: 3.5' to 14.5' below grade		Bottom 4": Black SAND, trace Silt.	Strong petroleum-like odor	Wet	58.5	NAPL	
10									
11		0.020-inch slotted Stainless Steel well screen: 4.5' to 14.5'	25"	Black and Dark Brown SAND, trace Silt, Gravel.	Strong petroleum-like odor	Wet	46.1	NAPL	
12									
13		End cap: 14.5' below grade							
14									
15									
16									
17									
18									
19									
20									

Notes: Groundwater Depth Indicator

Groundwater was measured at 7.77 feet below basement grade.

Groundwater monitoring well installed to 14.5 feet below basement grade.

Soil sample collected for: Part 375 Pesticides, Part 375 Herbicides, Part 375 Target Analyte List (TAL) Metals, polychlorinated biphenyls (PCBs), Mercury, Cyanide, 1,4-Dioxane, Per- and Polyfluoroalkyl subtances (PFAS) - standard 21 compound list.

Groundwater encountered at approximately 8 feet below basement grade during soil boring installation.

End of soil boring at 14.5 feet below basement grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Extraction Well ID: Sheet 1 of 2	RW-03	Soil Boring ID:	RW-03

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Geoprobe
Sampling Method:	5" Macrocore/Hollow Stem Auger
Driller:	ADT
Weather:	41° F , Sunny
Logged by:	V. Chang/M. Jepsen, AKRF

Drilling

Start Time: 12:30 (3/12/21) **Finish Time:** 12:15 (3/15/21)

Date: 3/12/2021 - 3/15/2021

Surface Condition: Concrete

Depth (feet)	Well Construction	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1	Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.	60"	Top 12": CONCRETE.	None	Dry	ND	ND	
2	4" diameter PVC well casing: grade to 13' below grade		Next 12": GRAVEL	None	Dry	ND	ND	
3			Top 12": Brown SAND, some Gravel, trace Silt (FILL).	None	Dry	ND	ND	
4								
5								
6	No. 2 morie sandpack filter: 1' to 7' below grade	60"	Brown SAND, trace Silt, Gravel, Wood (FILL).	None	Dry	ND	ND	
7								
8	Grout seal: 7' to 9' below grade							
9								
10	Bentonite seal: 9' to 11' below grade							
11								
12	No. 00 morie sandpack filter: 11' to 12' below grade	60"	Brown SAND, trace Silt, Gravel, Wood (FILL).	None	Dry	ND	ND	
13								
14	No. 2 morie sandpack filter: 12' to 23' below grade							
15								
16								
17		60"	Black SAND, trace Silt, Gravel.	Petroleum-like odor	Wet	38.2	NAPL staining	
18	0.020-inch slotted Stainless Steel well screen: 13' to 23'							
19								
20								

Notes: Groundwater Depth Indicator

Groundwater was measured at 15.94 feet below sidewalk grade.

Groundwater extraction well installed to 23 feet below sidewalk grade.

No soil samples collected.

Groundwater encountered at approximately 15 feet below sidewalk grade during soil boring installation.

End of soil boring at 23 feet below sidewalk grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Extraction Well ID: Sheet 2 of 2	RW-03	Soil Boring ID:	RW-03

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Geoprobe
Sampling Method:	5' Macrocore/Hollow Stem Auger
Driller:	ADT
Weather:	41° F , Sunny
Logged by:	V. Chang/M. Jepsen, AKRF

Drilling

Start Time: 12:30 (3/12/21) **Finish Time:** 12:15 (3/15/21)

Date: 3/12/2021 - 3/15/2021

Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
21		End cap: 23' below grade	36	Brown SAND, trace Silt, Gravel.	None	Dry	ND	ND	
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									

Notes: **Groundwater Depth Indicator**

Groundwater was measured at 15.94 feet below sidewalk grade.

Groundwater extraction well installed to 23 feet below sidewalk grade.

No soil samples collected.

Groundwater encountered at approximately 15 feet below sidewalk grade during soil boring installation.

End of soil boring at 23 feet below sidewalk grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Injection Well ID: Sheet 1 of 1	IW-01	Soil Boring ID:	IW-01

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia
Sampling Method:	5' Macrocore/2' Split Spoon
Driller:	ADT, Inc.
Weather:	43° F , Cloudy
Logged by:	T. Simmons, AKRF

Drilling
Start Time: 8:45 **Finish Time:** 13:55
Date: 3/4/2021

Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1		Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.	60"	Top 8": CONCRETE.	None	Dry	ND	ND	
2		4" diameter PVC well casing: grade to 8' below grade		Next 4": GRAVEL.	None	Dry	ND	ND	
3		Grout seal: 1' to 2' below grade		Bottom 48": Brown SAND, some fine Gravel, Brick, trace Silt (FILL).	None	Dry	ND	ND	
4		Bentonite seal: 2' to 3' below grade							
5									
6		No. 00 morie sandpack filter: 3' to 4' below grade	60"	Brown SAND, little Gravel, Brick, trace Silt (FILL).	None	Dry	ND	ND	
7									
8									
9		No. 2 morie sandpack filter: 4' to 13' below grade							
10									
11		0.020-inch slotted Stainless Steel well screen: 8' to 13'	36"	Brown SAND, some fine Gravel, trace Silt.	None	Wet	0.1	ND	
12		End cap: 13' below grade							
13									
14									
15									
16									
17									
18									
19									
20									

Notes: ▼ **Groundwater Depth Indicator**

Groundwater was measured at approx. 6.07 feet below basement grade.

Groundwater injection well installed to 13 feet below basement grade.

No soil samples collected.

Groundwater encountered at approximately 10 feet below basement grade during soil boring installation.

End of soil boring at 13 feet below basement grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Injection Well ID: Sheet 1 of 1	IW-02	Soil Boring ID:	RW-3

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia
Sampling Method:	5' Macrocore/2' Split Spoon
Driller:	ADT
Weather:	81° F , Cloudy/Rain
Logged by:	M. Jepsen, AKRF

Drilling

Start Time: 13:30 (8/13/2020) **Finish Time:** 9:45 (8/17/2020)

Date: 8/13/2020 - 8/17/2020

Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1		Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.	60"	Top 8": CONCRETE.	None	Dry	ND	ND	
2		4" diameter PVC well casing: grade to 6' below grade		Next 4": GRAVEL.	None	Dry	ND	ND	
3		Grout seal: 1' to 3' below grade		Next 40": Light Brown SAND, trace Silt, Gravel.	None	Dry	0.1	ND	
4		Bentonite seal: 3' to 4' below grade							
5				Bottom 8": Dark Brown SAND, some Silt, trace Gravel.	Faint petroleum-like odor	Dry	0.5	ND	
6		No. 00 morie sandpack filter: 4' to 5' below grade	22"	Light Brown SAND, little Silt, trace Gravel.	Faint petroleum-like odor	Dry Moist	1	ND	"RW-3_5-7-_20200813" "RW-X_5-7-_20200813"
7									
8									
9		No. 2 morie sandpack filter: 5' to 16' below grade	N/A	Obstruction/boulder at 8.5' below grade. NO RECOVERY from 8.5' to 16'.	N/A	N/A	N/A	N/A	
10									
11		0.020-inch slotted Stainless Steel well screen: 6' to 16'							
12									
13									
14									
15		End cap: 16' below grade							
16									
17									
18									
19									
20									

Notes: **Groundwater Depth Indicator**

Groundwater was measured at approx. 6.24 feet below basement grade.

Groundwater injection well installed to 16 feet below basement grade.

Soil sample collected for: Part 375 Pesticides, Part 375 Herbicides, Part 375 Target Analyte List (TAL) Metals, polychlorinated biphenyls (PCBs), Mercury, Cyanide, 1,4-Dioxane, Per- and Polyfluoroalkyl subtances (PFAS) - standard 21 compound list. Blind duplicate collected from 5 to 7 feet below grade.

Groundwater encountered at approximately 8.5 feet below basement grade during soil boring installation.

End of soil boring at 16 feet below basement grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Injection Well ID: Sheet 1 of 1	IW-03	Soil Boring ID:	IW-03

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia
Sampling Method:	5' Macrocore/2' Split Spoon
Driller:	ADT, Inc.
Weather:	34° F , Sunny
Logged by:	T. Simmons, AKRF

Drilling

Start Time: 13:45 **Finish Time:** 11:45

Date: 3/5/2021 - 3/6/2021

Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1		Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.	60"	Top 8": CONCRETE.	None	Dry	ND	ND	
2		4" diameter PVC well casing: grade to 8' below grade		Next 4": GRAVEL.	None	Dry	ND	ND	
3		Grout seal: 1' to 2' below grade		Bottom 48": Brown SAND, some fine Gravel, Brick, Concrete, trace Silt (FILL).	None	Dry	ND	ND	
4		Bentonite seal: 2' to 3' below grade							
5									
6		No. 00 morie sandpack filter: 3' to 6' below grade	60"	Brown SAND, little Gravel, Brick, Concrete, trace Silt (FILL).	None	Dry	ND	ND	
7									
8									
9		No. 2 morie sandpack filter: 6' to 13' below grade							
10									
11		0.020-inch slotted Stainless Steel well screen: 8' to 13'	36"	Brown SAND, trace Silt.	None	Wet	ND	ND	
12		End cap: 13' below grade							
13									
14									
15									
16									
17									
18									
19									
20									

Notes: ▼ **Groundwater Depth Indicator**

Groundwater was measured at approx. 5.79 feet below basement grade.

Groundwater injection well installed to 13 feet below basement grade.

No soil samples collected.

Groundwater encountered at approximately 10 feet below basement grade during soil boring installation.

End of soil boring at 13 feet below basement grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Injection Well ID: Sheet 1 of 1	IW-04	Soil Boring ID:	IW-04

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia
Sampling Method:	5' Macrocore/2' Split Spoon
Driller:	ADT, Inc.
Weather:	42° F , Sunny
Logged by:	V. Chang, AKRF

Drilling

Start Time: 11:30 **Finish Time:** 10:25

Date: 3/9/2021 - 3/10/2021

Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1		**Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.**	60"	Top 6": CONCRETE.	None	Dry	ND	ND	
2		**4" diameter PVC well casing: grade to 8' below grade**		Next 24": GRAVEL.	None	Dry	ND	ND	
3		**Grout seal: grade to 2' below grade**		Bottom 30": CONCRETE.	None	Dry	ND	ND	
4		**Bentonite seal: 2' to 3' below grade**							
5									
6		**No. 00 morie sandpack filter: 3' to 7' below grade**	60"	Top 6": CONCRETE.	None	Dry	ND	ND	
7									
8				Bottom 54": GRAVEL and CRUSHED ROCK, little Sand, trace Silt.	None	Dry	ND	ND	
9		**No. 2 morie sandpack filter: 7' to 13' below grade**							
10									
11		**0.020-inch slotted Stainless Steel well screen: 8' to 13'**	36"	GRAVEL and CRUSHED ROCK, little Sand, trace Silt.	None	Wet	ND	ND	
12		**End cap: 13' below grade**							
13									
14									
15									
16									
17									
18									
19									
20									

Notes: ▼ **Groundwater Depth Indicator**

Groundwater was measured at approx. 5.50 feet below basement grade.

Groundwater injection well installed to 13 feet below basement grade.

No soil samples collected.

Groundwater encountered at approximately 10 feet below basement grade during soil boring installation.

End of soil boring at 13 feet below basement grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Injection Well ID: Sheet 1 of 1	IW-05	Soil Boring ID:	IW-05

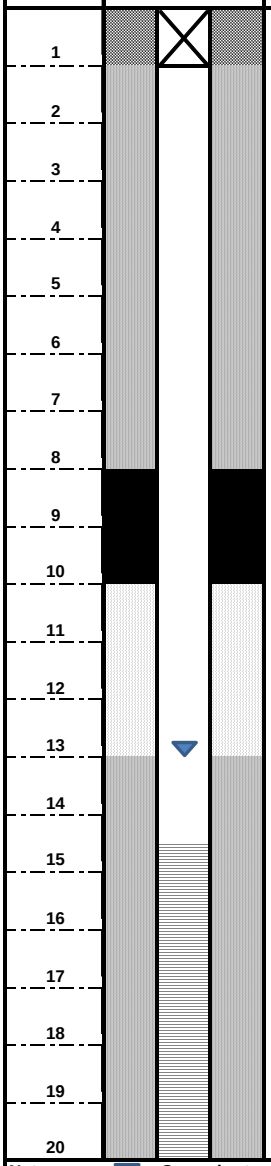
AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Geoprobe
Sampling Method:	5' Macrocore/Hollow Stem Auger
Driller:	ADT, Inc.
Weather:	46° F , Sunny
Logged by:	V. Chang, AKRF

Drilling

Start Time: 9:00 **Finish Time:** 13:10

Date: 3/11/2021



Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1		Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.	60"	Top 6": CONCRETE.	None	Dry	ND	ND	
2		4" diameter PVC well casing: grade to 15' below grade		Next 6": GRAVEL.	None	Dry	ND	ND	
3				Bottom 48": Brown SAND, some Gravel, little Brick, trace Silt (FILL).	None	Dry	ND	ND	
4									
5		No. 2 morie sandpack filter: 1' to 8' below grade							
6			60"	Brown SAND, some Gravel, little Brick, trace Silt (FILL).	None	Dry	ND	ND	
7									
8		Grout seal: 8' to 10' below grade							
9									
10		Bentonite seal: 10' to 13' below grade							
11									
12		No. 00 morie sandpack filter: 13' to 14' below grade	60"	Brown SAND, little Gravel, trace Silt.	None	Dry	ND	ND	
13									
14									
15		No. 2 morie sandpack filter: 14' to 20' below grade							
16									
17		0.020-inch slotted Stainless Steel well screen: 15' to 20'	60"	Brown SAND, little Gravel, trace Silt.	None	Wet	ND	ND	
18									
19		End cap: 20' below grade							
20									

Notes: ▼ **Groundwater Depth Indicator**

Groundwater was measured at approx. 12.90 feet below sidewalk grade.

Groundwater injection well installed to 20 feet below sidewalk grade.

No soil samples collected.

Groundwater encountered at approximately 15 feet below sidewalk grade during soil boring installation.

End of soil boring at 20 feet below sidewalk grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Injection Well ID: Sheet 1 of 1	IW-06	Soil Boring ID:	IW-06

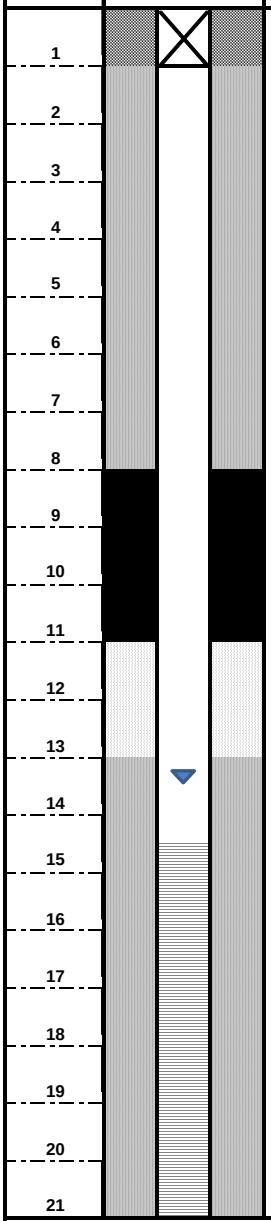
AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Geoprobe
Sampling Method:	5' Macrocore/Hollow stem auger/Hand Clearing
Driller:	ADT, Inc.
Weather:	46° F , Sunny
Logged by:	V. Chang, AKRF

Drilling

Start Time: 13:40 **Finish Time:** 12:10

Date: 3/11/2021 - 3/12/2021



Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1		Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.	50"	Top 18": CONCRETE.	None	Dry	ND	ND	
2		4" diameter PVC well casing: grade to 16' below grade		Next 12": GRAVEL.	None	Dry	ND	ND	
3				Bottom 30": Brown SAND, some Gravel, little Brick, trace Silt (FILL).	None	Dry	ND	ND	
4									
5		No. 2 morie sandpack filter: grade to 8' below grade	60"	Brown SAND, some Gravel, trace Silt.	None	Dry	ND	ND	
6									
7		Grout seal: 8' to 11' below grade							
8									
9									
10		Bentonite seal: 11' to 13' below grade	60"	Brown SAND, little Gravel, trace Silt.	None	Dry	ND	ND	
11									
12		No. 00 morie sandpack filter: 13' to 15' below grade							
13									
14		No. 2 morie sandpack filter: 15' to 21' below grade							
15									
16			72"	Brown SAND, little Gravel, trace Silt.	None	Wet	ND	ND	
17		0.020-inch slotted Stainless Steel well screen: 16' to 21'							
18									
19									
20		End cap: 21' below grade							
21									

Notes: ▼ **Groundwater Depth Indicator**

Groundwater was measured at approx. 13.22 feet below sidewalk grade.

Groundwater injection well installed to 21 feet below sidewalk grade.

No soil samples collected.

Groundwater encountered at approximately 15 feet below sidewalk grade during soil boring installation.

End of soil boring at 21 feet below sidewalk grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

SOIL BORING AND WELL INSTALLATION LOG	34 Berry Street AKRF Project Number: 11259	Groundwater Injection Well ID: Sheet 1 of 1	IW-07	Soil Boring ID:	IW-07

AKRF
440 Park Avenue South, 7th Floor
New York, NY 10016

Drilling Method:	Fordia
Sampling Method:	5' Macrocore/2' Split Spoon
Driller:	ADT, Inc.
Weather:	34° F , Sunny
Logged by:	T. Simmons, AKRF

Drilling

Start Time: 8:00 **Finish Time:** 13:45

Date: 3/5/2021

Depth (feet)	Well Construction	Surface Condition: Concrete	Recovery (Inches)	Soil Boring Log	Odor	Moisture	PID (ppm)	NAPL	Soil Samples Collected for Laboratory Analysis
1		Flush-mounted well cover, locking j-plug, and concrete seal: grade to 1' below grade.	60"	Top 8": CONCRETE.	None	Dry	ND	ND	
2		4" diameter PVC well casing: grade to 8' below grade		Next 4": GRAVEL.	None	Dry	ND	ND	
3		Grout seal: 1' to 2' below grade		Bottom 48": Brown SAND, some fine Gravel, Brick, Concrete, trace Silt (FILL).	None	Dry	ND	ND	
4		Bentonite seal: 2' to 3' below grade							
5									
6		No. 00 morie sandpack filter: 3' to 6' below grade	60"	Brown SAND, some fine Gravel, trace Silt.	None	Dry	ND	ND	
7									
8									
9		No. 2 morie sandpack filter: 6' to 13' below grade							
10									
11		0.020-inch slotted Stainless Steel well screen: 8' to 13'	36"	Brown SAND, some fine Gravel, trace Silt.	None	Wet	ND	ND	
12		End cap: 13' below grade							
13									
14									
15									
16									
17									
18									
19									
20									

Notes: ▼ **Groundwater Depth Indicator**

Groundwater was measured at approx. 5.95 feet below basement grade.

Groundwater injection well installed to 13 feet below basement grade.

No soil samples collected.

Groundwater encountered at approximately 10 feet below basement grade during soil boring installation.

End of soil boring at 13 feet below basement grade.

PID = photoionization detector NAPL = non-aqueous phase liquid ND = not detected ppm = parts per million

Soil classifications and descriptions presented are based on the Modified Burmister Classification System. Descriptions were developed for environmental purposes only.

APPENDIX C
EXCAVATION WORK PLAN

EXCAVATION WORK PLAN (EWP)

1.0 NOTIFICATION

At least 15 days prior to the start of any activity that is anticipated to encounter remaining contamination, the Site owner or their representative will notify NYSDEC. EWP Table 1 includes contact information for the above notification. The information on this table will be updated as necessary to provide accurate contact information.

EWP Table 1
Notifications*

Shaun Bollers NYSDEC Project Manager	(718)-482-4096 shaun.bollers@dec.ny.gov
Cris-Sandra Maycock NYSDEC, Superfund & Brownfield Cleanup Section, Region 2	(718) 482-4679 cris-sandra.maycock@dec.ny.gov
Kelly Lewandowski, P.E. NYSDEC, Chief, Site Control Section	(518) 402-9569 kelly.lewandowski@dec.ny.gov

*Notifications are subject to change and will be updated as necessary.

This notification will include:

- A detailed description of the work to be performed, including the location and areal extent of excavation, plans/drawings for Site re-grading, intrusive elements or utilities to be installed below the soil cover, estimated volumes of contaminated soil to be excavated, and any work that may impact an engineering control;
- A summary of environmental conditions anticipated to be encountered in the work areas, including the nature and concentration levels of contaminants of concern, potential presence of grossly contaminated media, and plans for any pre-construction sampling;
- A schedule for the work, detailing the start and completion of all intrusive work;
- A summary of the applicable components of this EWP;
- A statement that the work will be performed in compliance with this EWP and 29 CFR 1910.120;
- A copy of the contractor's health and safety plan (HASP), in electronic format, if it differs from the HASP provided in Appendix D of this SMP;
- Identification of disposal facilities for potential waste streams; and
- Identification of sources of any anticipated backfill, along with all required chemical testing results.

The NYSDEC project manager will review the notification and may impose additional requirements for the excavation that are not listed in this EWP.

2.0 SOIL SCREENING METHODS

Visual, olfactory and instrument-based [e.g. photoionization detector (PID)] soil screening will be performed by a Qualified Environmental Professional (QEP) or someone under the direct supervision of a QEP during all excavations into known or potentially contaminated material (remaining contamination). Soil screening will be performed when invasive work is done and will include all excavation and invasive

work performed during development, such as excavations for foundations and utility work, after issuance of the Certificate of Completion (COC).

Soils will be segregated based on previous environmental data and screening results into material that requires off-site disposal and material that requires testing to determine if the material can be reused on-site as soil beneath a cover or if the material can be used as cover soil. Further discussion of off-site disposal of materials and on-site reuse is provided in Sections 5.0 through 7.0 of this Appendix.

3.0 SOIL STAGING METHODS

Any soil excavated from areas on the Site not meeting the RRSCOs will be placed in separate designated stockpiles based on the results of field screening and/or laboratory analysis. Soil stockpiles will be contained on concrete pavement within the basement level parking garage or surface parking lot within the Site fencing and cordoned off from the general public with safety cones and caution tape. Alternatively, soil stockpiles may be contained within appropriately sized roll-off containers for temporary on-Site storage. Stockpiles will be kept covered at all times with appropriately anchored tarps. Stockpiles will be routinely inspected and damaged tarp covers will be promptly replaced.

Stockpiles will be inspected at a minimum once each week and after every storm event. Results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by the NYSDEC. Soil that exhibits evidence of contamination (i.e., elevated PID readings, staining, odors, etc.) will be separately staged for off-site disposal. Information on staged soil will be tracked in the Site field log book and updated at the end of each workday.

4.0 MATERIALS EXCAVATION AND LOAD-OUT

A QEP or person under their supervision will oversee all invasive work and the excavation and load-out of all excavated material. The owner of the property and remedial party (if applicable) and its contractors are responsible for safe execution of all invasive and other work performed under this EWP. The presence of utilities and easements on the Site will be investigated by the QEP. It will be determined whether a risk or impediment to the planned work under this SMP is posed by utilities or easements on the Site.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and New York State Department of Transportation (NYSDOT) requirements (and all other applicable transportation requirements).

The Site contains a Site cap consisting of impervious materials including the concrete foundation slab for the on-Site building and exterior concrete paving. The preferred method for material load-out will be performed with stockpiled material staged within steel roll-off containers with a steel bottom and side walls and covered with a tarp. If soil excavation and trucking occur following removal of the impervious concrete surface, a truck wash will be operated on-site, as appropriate. The QEP will be responsible for ensuring that all outbound trucks will be washed at the truck wash before leaving the Site until the activities performed under this section are complete. Truck wash waters will be collected and disposed of off-site in an appropriate manner. Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-site soil tracking. The QEP will be responsible for ensuring that all egress points for truck and equipment transport from the Site are clean of dirt and other materials derived from the Site during intrusive excavation activities. Cleaning of the adjacent streets will be performed as needed to maintain a clean condition with respect to Site-derived materials.

5.0 MATERIALS TRANSPORT OFF-SITE

All transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded. Material transported by trucks exiting the Site will be secured with tight-fitting covers. Loose-fitting canvas-type truck covers will be prohibited. If loads contain wet material capable of producing free liquid, truck liners will be used.

All trucks loaded with Site materials will exit the vicinity of the site using only these approved truck routes. This is the most appropriate route and takes into account: (a) limiting transport through residential areas and past sensitive sites; (b) use of city mapped truck routes; (c) prohibiting off-site queuing of trucks entering the facility; (d) limiting total distance to major highways; (e) promoting safety in access to highways; and (f) overall safety in transport.

Trucks will be prohibited from stopping and idling in the neighborhood outside the Site. Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development. Queuing of trucks will be performed on-site in order to minimize off-site disturbance. Off-site queuing will be prohibited.

6.0 MATERIALS DISPOSAL OFF-SITE

All material excavated and removed from the Site will be treated as contaminated and regulated material and will be transported and disposed in accordance with all local, State (including 6NYCRR Part 360) and Federal regulations. If disposal of material from the Site is proposed for unregulated off-site disposal (i.e. clean soil removed for development purposes), a formal request with an associated plan will be made to the NYSDEC. Unregulated off-site management of materials from this Site will not occur without formal NYSDEC approval.

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

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

7.0 MATERIALS REUSE ON-SITE

Material reuse on-site will comply with requirements of NYSDEC DER-10 Section 5.4(e)4. Any modifications to the requirements of DER-10 Section 5.4(e)4 must be approved by the NYSDEC project manager. Contaminated soil, or any material in direct contact with the contaminated soil, may not be separated for reuse on-site and will be disposed of as described previously in Section 5.0. Soil that does not exhibit evidence of contamination during field screening and is free of debris will be stockpiled and tested at a frequency of one sample per 500 cubic yards and characterized for reuse below the Site cover. The analytical results of soil/fill material testing must meet the site use criteria presented in NYSDEC DER-10 Appendix 5 – Allowable Constituent Levels for Imported Fill or Soil for all constituents listed, and the

NYSDEC Sampling, Analysis, and Assessment of Per- and Polyfluoroalkyl Substances. Chemical criteria for on-site reuse of material will meet the lower of the NYSDEC Part 375 protection of groundwater or the protection of public health for restricted residential use SCOs and can only be used as backfill beneath the composite cover system for the approved use of the Site consistent with the Environmental Easement (EE). The QEP will ensure that procedures defined for materials reuse in this SMP are followed and that unacceptable material does not remain on-site. Contaminated on-site material, including historic fill and contaminated soil, that is acceptable for reuse on-site will be placed below the demarcation layer or impervious surface, and will not be reused within a cover soil layer, within landscaping berms, or as backfill for subsurface utility lines.

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

8.0 FLUIDS MANAGEMENT

All liquids to be removed from the Site, including but not limited to, excavation dewatering, decontamination waters and groundwater monitoring well purge and development waters, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Dewatering, purge and development fluids will not be recharged back to the land surface or subsurface of the Site, and will be managed off-site, unless prior approval is obtained from NYSDEC.

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

9.0 COVER SYSTEM RESTORATION

After the completion of soil removal and any other invasive activities the cover system will be restored in a manner that complies with the RAWP. The existing cover system is composed of a minimum of 6 inches of concrete building slab underlain by a vapor barrier, and concrete or asphalt paving in all exterior areas, including the exterior courtyard and surface parking lot. If the type of cover system changes from that which exists prior to the excavation, this will constitute a modification of the cover element of the remedy and the upper surface of the remaining contamination. A figure showing the modified surface will be included in the subsequent PRR and in an updated SMP.

10.0 BACKFILL FROM OFF-SITE SOURCES

All materials proposed for import onto the Site will be approved by the QEP and will be in compliance with provisions in this SMP prior to receipt at the Site. A Request to Import/Reuse Fill or Soil form, which can be found at http://www.dec.ny.gov/regulations/67386.html, will be prepared and submitted to the NYSDEC project manager allowing a minimum of 5 business days for review.

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

Soil imported to the Site for use in a soil cap, soil cover, or as backfill must be tested for 1,4-dioxane and PFAS contamination in general conformance with DER-10, Section 5.4(e). Soil samples must be analyzed for 1,4-dioxane using EPA Method 8270, as well as the full list of PFAS compounds (currently 21) using

EPA Method 537.1 (modified). For 1,4-dioxane, soil exceeding the Unrestricted SCO of 0.1 parts per million (ppm) must be rejected per DER 10: Appendix 5 - Allowable Constituent Levels for Imported Fill or Soil, Subdivision 5.4(e). If PFOA or PFOS is detected in any sample at or above 1 parts per billion (ppb), then a soil sample must be tested by the Synthetic Precipitation Leaching Procedure (SPLP) and the leachate analyzed. If the SPLP results exceed 70 parts per trillion (ppt) combined PFOA/S, then the source of backfill must be rejected. Remedial parties have the option of analyzing samples concurrently for both PFAS in soil and in the SPLP leachate to minimize project delays.

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

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

11.0 EXCAVATION CONTINGENCY PLAN

If underground storage tanks (USTs) or other previously unidentified contaminant sources are found during post-remedial subsurface excavations or development related construction, excavation activities will be suspended until sufficient equipment is mobilized to address the condition. The NYSDEC project manager will be promptly notified of the discovery.

Sampling will be performed on product, sediment and surrounding soils, etc. as necessary to determine the nature of the material and proper disposal method. Chemical analysis will be performed for a full list of analytes (Target Analyte List [TAL] metals; Target Compound List [TCL] volatile organic compounds [VOCs] and semivolatile organic compounds [SVOCs], TCL pesticides, emerging contaminants, and polychlorinated biphenyls [PCBs]), unless the Site history and previous sampling results provide a sufficient justification to limit the list of analytes. In this case, a reduced list of analytes will be proposed to the NYSDEC for approval prior to sampling.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. Reportable quantities of petroleum product will also be reported to the NYSDEC spills hotline. These findings will be also included in the PRR.

12.0 COMMUNITY AIR MONITORING PLAN

Work zone monitoring will be performed for the health and safety of workers during intrusive work activities in accordance with action levels and guidance outlined in the site-specific HASP. During intrusive activities, all windows and doors at street level will remain closed to prevent exposure to the public and the existing ventilation system and any additional ventilation fans will vent to the roof.

Community air monitoring performed during intrusive activities outside of the on-Site building will be performed at the perimeter of the Site continuously during intrusive Site activities including loading or staging of excavated soil prior to transportation and off-site disposal. Community air monitoring performed within the on-Site building will be included outside the exclusion zone at potential exposure point(s) for building occupants. These locations may include hallways and/or areas adjacent to ventilation features that connect with the work zone. In addition, community air monitoring will be performed periodically (at a minimum once per hour) on a roving basis with a concentration on any active exterior work area(s).

VOC and particulate monitoring equipment will consist of a PID capable of detecting the VOCs found in the excavated soil and real-time aerosol or particulate monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM_{10}). VOC monitoring equipment will be calibrated, and the particulate monitoring equipment zeroed on a daily basis and documented in a dedicated field log book. Both VOC and particulate monitoring equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the prescribed action levels.

If VOC monitoring results in the ambient air concentration of total organic vapors in excess of 5 parts per million (ppm) above background for the 15-minute average, work activities will be temporarily halted and monitoring continued. If the total organic vapor level readily decreases below 5 ppm over background, work activities can resume with measures taken to reduce vapors and continue monitoring. If total organic vapor levels persist at levels in excess of 5 ppm over background, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. If the organic vapor level is repeatedly over 25 ppm above background, activities will be shut down and the engineering controls and the Site work plan re-evaluated.

If particulate monitoring results in a 15-minute average concentration measurement that is between 100 micrograms per cubic meter ($\mu g/m^3$) and 150 $\mu g/m^3$ above the background level, additional dust suppression techniques will be implemented to reduce the generation of fugitive dust and corrective action taken to protect Site personnel and reduce the potential for contaminant migration. Should dust suppression measures being utilized not lower particulates to an acceptable level (e.g., below 150 $\mu g/m^3$ above the background level, and no visible dust from the work area), work will be suspended until appropriate corrective measures are implemented to remedy the situation.

Details regarding work zone and community air monitoring are outlined in the HASP and CAMP attached as Appendix D of the SMP. Exceedances of action levels listed in the CAMP will be reported to the NYSDEC and NYSDOH project managers.

The locations of air sampling stations will be determined prior to the start of any exterior work based on wind conditions to provide an upwind and at least two downwind monitoring stations. At least one fixed monitoring station will be located on the eastern Site perimeter nearby the adjacent residential buildings during exterior intrusive work. The locations of air sampling stations will be determined prior to the start of excavation work within the on-Site building based on the location of interior work areas with respect to the potential exposure point(s) for the building occupants to provide up to two monitoring stations at the entry for the exposure point(s). If additional sensitive receptors are identified during Site work (i.e., daycares, schools, etc.), the CAMP stations will be moved adjacent to any such receptors.

13.0 ODOR CONTROL PLAN

This odor control plan is capable of controlling emissions of nuisance odors emanating on-site. Specific odor control methods to be used on a routine basis will include monitoring by the on-site QEP or personnel under their direct supervision. If nuisance odors are identified at the Site boundary, or if odor complaints are received, work will be halted and the source of odors will be identified and corrected. Work will not resume until all nuisance odors have been abated. NYSDEC and NYSDOH will be notified of all odor events and of any other complaints about the project. Implementation of all odor controls, including the halt of work, is the responsibility of the remedial party's Remediation Engineer, and any measures that are implemented will be discussed in the PRR.

All necessary means will be employed to prevent on- and off-site nuisances. At a minimum, these measures will include: (a) limiting the area of open excavations and size of soil stockpiles; (b) shrouding open excavations with tarps and other covers; and (c) using foams to cover exposed odorous soils. If odors

develop and cannot be otherwise controlled, additional means to eliminate odor nuisances will include: (d) direct load-out of soils to trucks for off-site disposal; (e) use of chemical odorants in spray or misting systems; and, (f) use of staff to monitor odors in surrounding neighborhoods.

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

14.0 DUST CONTROL PLAN

A dust suppression plan that addresses dust management during invasive on-site work will include, at a minimum, the items listed below:

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

15.0 OTHER NUISANCES

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

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

APPENDIX D
HEALTH AND SAFETY PLAN AND COMMUNITY AIR MONITORING PLAN

34 Berry Street

BROOKLYN, NEW YORK

Health and Safety Plan (HASP) and
Community Air Monitoring Plan (CAMP)

BCP Site #: C224268

AKRF Project Number: 11259

Prepared for:

34 Berry Street LLC (LCOR)
34 Berry Street
Brooklyn, NY 11249

Prepared by:

AKRF, Inc.
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JANUARY 2022

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Figure 1 – Hospital Route Map

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1.0 INTRODUCTION

This Health and Safety Plan (HASP) and Community Air Monitoring Plan (CAMP) were prepared by AKRF, Inc. (AKRF) on behalf of 34 Berry Street, LLC (the Volunteer) for the 34 Berry Street site located at 34 Berry Street in the Williamsburg neighborhood of Brooklyn, New York, herein referred to as "the Site". The Site is also identified as Brooklyn Borough Tax Block 2289, Lot 14. The Site consists of a 36,000 square foot, irregularly shaped lot. The Site is currently enrolled in the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) (BCP Site No. C224268).

The Site is occupied by an L-shaped, seven-story residential building that fronts Berry and North 12th Streets, with an open courtyard area located behind the building, in the central portion of the Site. A basement level parking garage is located under the building and courtyard, with an entrance ramp located on North 11th Street. A small, street-level valet parking lot is also located on North 11th Street, immediately east of the garage entrance ramp. The Site is surrounded by: North 11th Street and two low-rise residential buildings to the south, and a warehouse building used by the Brooklyn Brewery to the west. The surrounding neighborhood is primarily residential and commercial in nature, containing apartment buildings, businesses and storage warehouses.

Available records have documented that the property was historically developed with industrial and manufacturing uses. Based on investigations and quarterly monitoring conducted to date, identified contamination at the Site includes light non-aqueous phase liquid (LNAPL), volatile organic compounds (VOCs), and semi-volatile organic compounds (SVOCs) associated with a petroleum spill, and chlorinated VOCs associated with a solvent plume in groundwater. Operation, monitoring, and maintenance (OM&M) activities completed to monitor remediation efforts to clean up the spill has identified a chlorinated solvent plume in groundwater. This HASP identifies the hazards of concern, the specific chemicals associated with the Site-specific hazards, and measures to provide protection for on-site workers from exposure to the hazards during the remedial action work. The CAMP (section 3.0) describes perimeter air monitoring requirements, corrective action levels, and associated response actions to prevent exposures to the surrounding community.

All AKRF employees are directed that all work must be performed in accordance with the Company's Generic HASP and all OSHA applicable regulations for the work activities required for the project. All project personnel are furthermore directed that they are not permitted to enter Permit Required Confined Spaces (as defined by OSHA). For issues unrelated to contaminated materials, all non-AKRF employees are to be bound by all applicable OSHA regulations as well as any more stringent requirements specified by their employer in their corporate HASP or otherwise. AKRF is not responsible for providing oversight for issues unrelated to contaminated materials for non-employees. This oversight shall be the responsibility of the employer of that worker or other official designated by that employer.

2.0 HEALTH AND SAFETY GUIDELINES AND PROCEDURES

2.1 Hazard Evaluation

2.1.1 Hazards of Concern

Check all that apply		
(**X**) Organic Chemicals	(**X**) Inorganic Chemicals	( ) Radiological
( ) Biological	(**X**) Explosive/Flammable	( ) Oxygen Deficient Atm
(**X**) Heat Stress	(**X**) Cold Stress	( ) Carbon Monoxide
Comments: No personnel are permitted to enter permit confined spaces.		

2.1.2 Physical Characteristics

Check all that apply		
(**X**) Liquid	(**X**) Solid	( ) Sludge
(**X**) Vapors	( ) Unknown	( ) Other
Comments:		

2.1.3 Hazardous Materials

Check all that apply					
Chemicals	**Solids**	**Sludges**	**Solvents**	**Oils**	**Other**
( ) Acids	( ) Ash	( ) Paints	(**X**) Halogens	( ) Transformer	( ) Lab
( ) Caustics	( ) Asbestos	( ) Metals	( ) Petroleum	( ) Other DF	( ) Pharm
( ) Pesticides	( ) Tailings	( ) POTW	(**X**) Other: Chlorinated Solvents	( ) Motor or Hydraulic Oil	( ) Hospital
(**X**) Petroleum	(**X**) Other	( ) Other		(**X**) Gasoline	( ) Rad
( ) Inks	Historic fill material			(**X**) Fuel Oil	( ) MGP
( ) PCBs					( ) Mold
( ) Metals					( ) Cyanide
(**X**)Other: VOCs & SVOCs					

2.1.4 Chemicals of Concern

Chemicals	REL/PEL/STEL	Health Hazards
1,2 Dichloroethane (DCA)	REL = 1 ppm PEL = 50 ppm	Headaches, lung irritation, dizziness, poor coordination, impaired heart function, unconsciousness, and nerve, kidney and liver damage.
Benzene	REL = 0.1 ppm PEL = 1 ppm STEL = 5 ppm	Irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude, dermatitis; bone marrow depression, potential occupational carcinogen.
Toluene	REL = 100 ppm PEL = 200 ppm STEL = 300 ppm	Irritation eyes, nose; lassitude, confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia (skin tingling or numbness); dermatitis; liver, kidney damage.
Ethylbenzene	REL = 100 ppm PEL = 100 ppm	Irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma.
Xylenes	REL = 100 ppm PEL = 100 ppm	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, poor coordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.
Naphthalene	REL = 10 ppm PEL = 10 ppm	Irritation eyes; headache, confusion, excitement, malaise; nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage.
Polycyclic Aromatic Hydrocarbons (PAHs)	PEL = 5 mg/m^3	Harmful effects to skin, bodily fluids, and ability to fight disease, reproductive problems; [potential occupational carcinogen]
Fuel Oil	REL = 350 mg/m^3 PEL = 400 ppm	Nausea, irritation – eyes, hypertension, headache, light-headedness, loss of appetite, poor coordination; long-term exposure – kidney damage, blood clotting problems; potential carcinogen.
Tetrachloroethylene (PCE)	REL = Lowest possible PEL = 100 ppm STEL = 100 ppm	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination, headache, drowsiness, skin erythema (skin redness), and liver damage.
Trichloroethylene (TCE)	REL = 25 ppm PEL = 100 ppm	Headaches, lung irritation, dizziness, poor coordination, impaired heart function, unconsciousness, and nerve, kidney and liver damage.
1,2 Dichloroethene (DCE)	REL = 200 ppm PEL = 200 ppm	Nausea, drowsy, tiredness possible heart damage.
Comments: REL = NIOSH Recommended Exposure Limit PEL = OSHA Permissible Exposure Limit STEL = OSHA Short Term Exposure Limit ppm = parts per million mg/m^3 = milligrams per cubic meter		

2.2 Designated Personnel

AKRF will appoint one of its on-site personnel as the Site Safety Officer (SSO). This individual will be responsible for the implementation of the HASP. The SSO will have a 4-year college degree in occupational safety or a related science/engineering field, and experience in implementation of air monitoring and hazardous materials sampling programs. Health and safety training required for the SSO and all field personnel are outlined in Section 2.3 of this HASP.

2.3 Training

All personnel who enter the work area while intrusive activities are being performed will have completed a 40-hour training course that meets OSHA requirements of 29 CFR Part 1910, Occupational Safety and Health Standards. In addition, all personnel will have up-to-date 8-hour refresher training. The training will allow personnel to recognize and understand the potential hazards to health and safety. All field personnel must attend a training program, whose purpose is to:

- Make them aware of the potential hazards they may encounter;
- Provide the knowledge and skills necessary for them to perform the work with minimal risk to health and safety;
- Make them aware of the purpose and limitations of safety equipment; and
- Ensure that they can safely avoid or escape from emergencies.

Each member of the field crew will be instructed in these objectives before he/she goes onto the Site. A site safety meeting will be conducted at the start of the project. Additional meetings shall be conducted, as necessary, for new personnel working at the Site.

2.4 Medical Surveillance Program

All AKRF and subcontractor personnel performing field work involving subsurface disturbance at the Site are required to have passed a complete medical surveillance examination in accordance with 29 CFR 1910.120 (f). A physician's medical release for work will be confirmed by the SSO before an employee can begin site activities. The medical release shall consider the type of work to be performed and the required PPE. The medical examination will, at a minimum, be provided annually and upon termination of hazardous waste site work.

2.5 Site Work Zones

During any activities involving subsurface disturbance, the work area must be divided into various zones to prevent the spread of contamination, ensure that proper protective equipment is donned, and provide an area for decontamination.

The Exclusion Zone is defined as the area where exposure to impacted media could be encountered. The Contamination Reduction Zone (CRZ) is the area where decontamination procedures take place and is located next to the Exclusion Zone. The Support is the zone area where support facilities such as vehicles, fire extinguisher, and first aid supplies are located. The emergency staging area (part of the Support Zone) is the area where all workers on-site would assemble in the event of an emergency. A summary of these areas is provided below. These zones may changed by SSO, depending on that day's activities. All field personnel will be informed of the location of these zones before work begins.

Task	Exclusion Zone	CRZ	Support Zone
Soil Borings/ Injection, Extraction, and Monitoring Wells/Groundwater Pumping and Recirculation Wells/Trenching	10 ft from drilling/excavation equipment or sampling personnel	25 ft from drilling equipment or sampling personnel, or within the interior room where the work is being performed.	As Needed
Comments: Control measures such as "caution tape" and/or traffic cones will be placed around the perimeter of the work area when work is being done in a public area.			

2.6 Air Monitoring

The purpose of the air monitoring program is to identify any exposure of the field personnel to potential environmental hazards associated with the documented soil and groundwater contamination. Results of the air monitoring will be used to determine the appropriate response action, if needed.

2.6.1 Volatile Organic Compounds

A photoionization detector (PID) will be used to perform air monitoring during soil disturbance activities to determine airborne levels of total VOCs. The PID will be calibrated at the start of the work day with a 100 ppm isobutylene standard.

2.6.2 Work Zone Air Monitoring

Real time air monitoring will be performed with the PID. Measurements will be taken prior to commencement of work and continuously during the work, as outlined in the following table. Measurements will be made as close to the workers as practicable and at the breathing height of the workers. The SSO shall set up the equipment and confirm that it is working properly. His/her designee may oversee the air measurements during the day. The initial measurement for the day will be performed before the start of work and will establish the background level for that day. The final measurement for the day will be performed after the end of work. The action levels and required responses are listed in the following table.

Instrument	Action Level	Response Action
PID	Less than 10 ppm in breathing zone	Level D or D-Modified
	Between 10 ppm and 20 ppm	Level C
	More than 20 ppm	Stop work. Resume work when readings are less then 20 ppm.
Notes: ppm = parts per million		

2.7 Personal Protection Equipment

The personal protection equipment required for various kinds of site investigation tasks are based on 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, Appendix B, "General Description and Discussion of the Levels of Protection and Protective Gear."

AKRF field personnel and other site personnel shall wear, at a minimum, Level D personal protective equipment. The protection will be based on the air monitoring described in Section 2.6.

LEVEL OF PROTECTION & PPE		**Soil Boring/Water Sampling**
Level D (**X**) Steel Toe Shoes (**X**) Hard Hat (within 25 ft of drill rig) (**X**) Work Gloves	(**X**) Safety Glasses ( ) Face Shield (**X**) Ear Plugs (within 25 ft of drill rig) (**X**) Nitrile Gloves (**X**) Tyvek for drill operator if NAPL present	Yes
Level C *(in addition to Level D)* (**X**) Half-Face Respirator OR (**X**) Full Face Respirator ( ) Full-Face PAPR	( ) Particulate Cartridge ( ) Organic Cartridge (**X**) Dual Organic/ Particulate Cartridge	If PID > 10 ppm (breathing zone)
Comments: Cartridges to be changed out at least once per shift unless warranted beforehand (e.g., more difficult to breathe or any odors detected).		

2.8 General Work Practices

To protect the health and safety of the field personnel, field personnel will adhere to the guidelines listed below during activities involving subsurface disturbance:

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited, except in designated areas on the Site. These areas will be designated by the SSO.
- Workers must wash their hands thoroughly on leaving the work area and before eating, drinking, or any other such activity.
- The workers should shower as soon as possible after leaving the Site. Contact with contaminated or suspected surfaces should be avoided.
- The buddy system should always be used; each buddy should watch for signs of fatigue, exposure, and heat/cold stress.

3.0 COMMUNITY AIR MONITORING PLAN

Community air monitoring will be conducted during all intrusive site activities in compliance with the New York State Department of Health (NYSDOH) Generic Community Air Monitoring Plan (CAMP). Real-time air monitoring for volatile compounds at the perimeter of the exclusion zone and at additional remote air monitoring stations will be performed as described below.

VOC Monitoring

Periodic monitoring for VOCs will be conducted during non-intrusive activities such as the collection of groundwater samples. Periodic monitoring may include obtaining measurements upon arrival at a location, while opening a monitoring well cap, when bailing/purging a well, and upon leaving the location. In some instances, depending on the proximity of exposed individuals, continuous monitoring may be conducted during these activities.

Continuous monitoring for VOCs will be conducted during all ground intrusive activities (e.g., injection/recovery well installation, trenching for piping, etc.). VOC concentrations will be measured in the work zone and at select remote monitoring stations at the start of each workday, and periodically thereafter to establish background concentrations. Since all of the work described in the SMP is being completed indoors, monitoring locations will selected based on access points (i.e., hallways) and any ventilation structures that would potentially be connected to air flow within the work area to provide for appropriate protection for building occupants.

Exclusion Zone Perimeter Monitoring

VOCs will be monitored continuously at the perimeter of the exclusion zone using handheld equipment. Monitoring will be conducted with a photoionization detector (PID) equipped with a 10.6 eV lamp capable of calculating 15-minute running average concentrations. The following actions will be taken based on organic vapor levels measured:

- If total organic vapor levels exceed 5 ppm above background for the 15-minute average at the exclusion zone perimeter, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 5 ppm above background, work activities will resume with continued monitoring.
- If total organic vapor levels at the perimeter of the exclusion zone persist at levels in excess of 5 ppm above background but less than 25 ppm, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less – but in no case less than 20 feet – is below 5 ppm above background for the 15-minute average.
- If the total organic vapor level is above 25 ppm at the perimeter of the exclusion zone, activities will be shut down, and the Major Vapor Emission Response Plan will be automatically implemented.

More frequent intervals of monitoring will be conducted if required as determined by the SSO. All 15-minute readings will be recorded and available for NYSDEC and NYSDOH personnel to review. Instantaneous readings, if any, will also be recorded.

Remote Fixed Air Monitoring Stations

Fixed monitoring stations will be included outside of the exclusion zone at potential exposure points for building occupants. These locations may include hallways and/or areas adjacent to ventilation features

that connect with the work zone. The fixed monitoring stations will be fully enclosed and equipped with the following:

- A PID equipped with an 10.6 eV lamp capable of calculating 15-minute running average VOC concentrations;

All air monitoring data recorded at the fixed monitoring stations will be available for NYSDOH and/or NYSDEC review and will be included in the annual Periodic Review Reports (PRR).

Major Vapor Emission Response Plan

If any organic levels greater than 1 ppm over background are identified at a remote fixed monitoring station, all work activities must be halted or vapor controls must be implemented.

If, following the cessation of the work activities, or as the result of an emergency, organic levels persist above 1 ppm above background at a monitoring station, then the following contingency measures will be implemented:

- If total organic vapor levels exceed 1 ppm above background for the 15-minute average at the monitoring station, work activities will be temporarily halted and monitoring continued. If levels readily decrease (per instantaneous readings) below 1 ppm above background, work activities will resume with continued monitoring.
- If total organic vapor levels at the monitoring station persist at levels in excess of 1 ppm above background, work activities will be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities will resume provided that the total organic vapor level at the monitoring station is below 1 ppm above background for the 15-minute average.
- If the total organic vapor level remains above 1 ppm at the monitoring station, activities will be shut down, and the Major Vapor Emission Response Plan will be automatically implemented.

Major Vapor Emission Response Plan

- Upon activation, the following activities shall be undertaken as part of the Major Vapor Emission Response Plan:
- The NYSDEC, NYSDOH, and local police authorities will immediately be contacted by the SSO and advised of the situation;
- Frequent air monitoring will be conducted at 30-minute intervals at the monitoring stations. If two successive readings below action levels are measured, air monitoring may be halted or modified by the Site Health and Safety Officer; and
- All Emergency contacts will go into effect as appropriate.

All readings will be recorded and be available for NYSDEC and NYSDOH personnel to review.

4.0 EMERGENCY PROCEDURES AND EMERGENCY RESPONSE PLAN

The field crew will be equipped with emergency equipment, such as a first aid kit and disposable eye washes. In the case of a medical emergency, the SSO will determine the nature of the emergency and he/she will have someone call for an ambulance, if needed. If the nature of the injury is not serious, i.e., the person can be moved without expert emergency medical personnel, he/she should be taken to a hospital by on-site personnel. Directions to the hospital are provided below, and a hospital route map is attached.

4.1 Hospital Directions

Hospital Name:	Woodhull Medical Center
Phone Number:	(718) 963-8000
Address/Location:	760 Broadway Brooklyn, NY 11206 (The Emergency Department is located at the intersection of Flushing Avenue and Throop Avenue)
Directions:	1. Leave Basement Garage and Turn LEFT onto *N. 11th Street* 2. Turn LEFT on *Berry Street* 3. Continue onto *Nassau Avenue* 4. Turn LEFT onto *Bedford Avenue* 5. Turn RIGHT onto *Lorimer Street* 6. Turn LEFT onto *Broadway* 7. Turn RIGHT on *Flushing Avenue* The Emergency Department entrance will be at the intersection of Flushing Avenue and Throop Avenue.

4.2 Emergency Contacts

Company	Individual Name	Title	Contact Number
AKRF	Marc Godick	Project Director	914-922-2356
	Bryan Zieroff	Project Manager	914-922-2382 (office) 203-246-1566 (cell)
	Mark Jepsen	Deputy Project Manager	646-388-9567 (office) 614-560-5425 (cell)
	Haile Thompson	Site Safety Officer (SSO)	646-388-9549 (office) 518-637-7689 (cell)
	Tom Giordano	SSO Alternate	646-388-9833 (office) 828-550-2612 (cell)
34 Berry Street, LLC (LCOR)	Joseph C. Venuto, Jr.	Asset Manager	610-408-4436 (office)
Ambulance, Fire Department & Police Department	-	-	911
NYSDEC Spill Hotline	-	-	800-457-7362

5.0 APPROVAL & ACKNOWLEDGMENTS OF HASP

APPROVAL

Signed: _____ Date: _____

AKRF Project Manager

Signed: _____ Date: _____

AKRF Health and Safety Officer

Below is an affidavit that must be signed by all workers who enter the Site. A copy of the HASP must be on-site at all times and will be kept by the SSO.

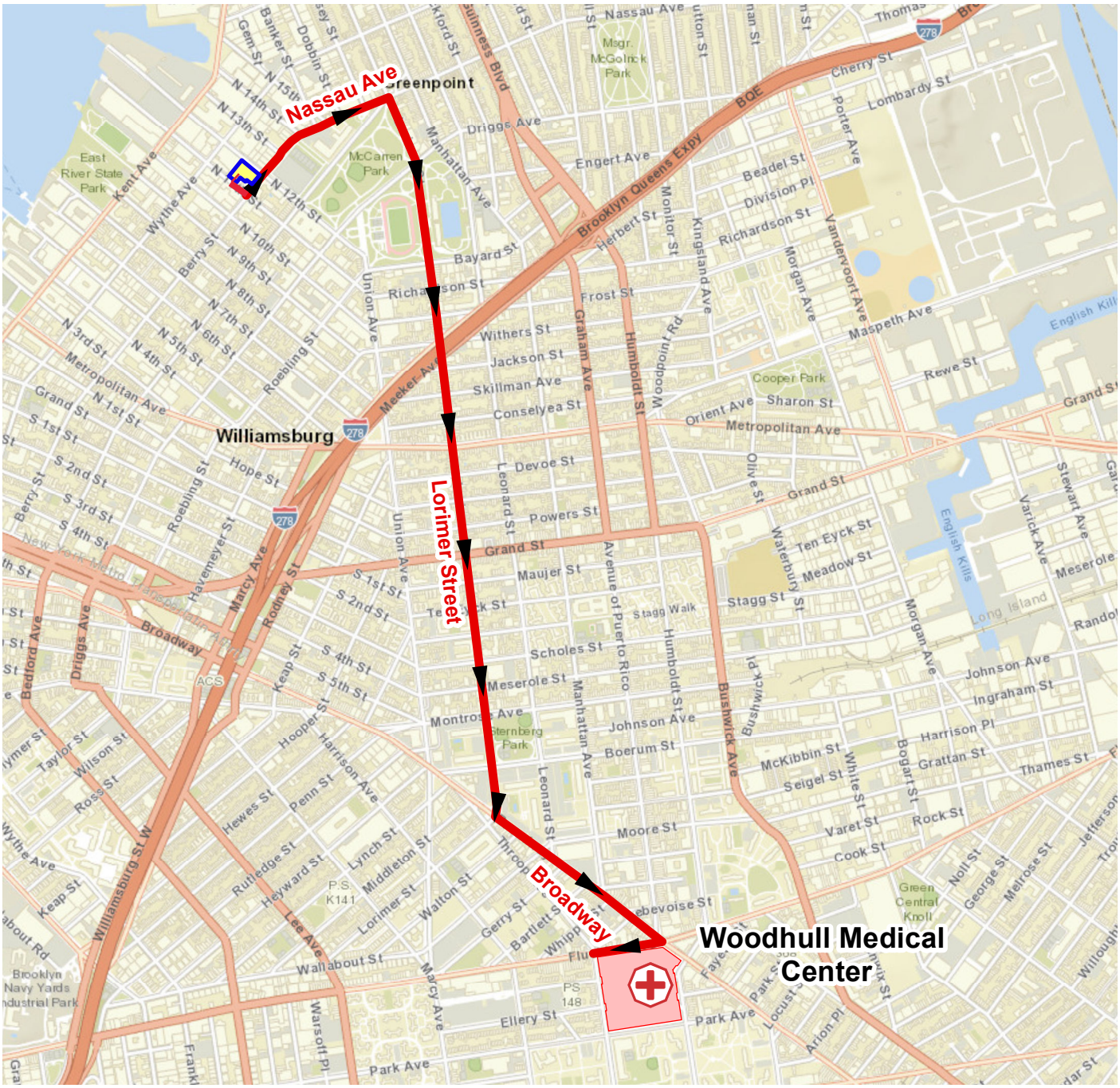
AFFIDAVIT

I,_____(name), of_____(company name), have read the Health and Safety Plan (HASP) for the 34 Berry Street site. I agree to conduct all on-site work in accordance with the requirements set forth in this HASP and understand that failure to comply with this HASP could lead to my removal from the Site.

Signed: _____ Company: _____ Date: _____
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FIGURE 1

HOSPITAL ROUTE MAP



Service Layer Credits: ESRC World Street Map 2016

LEGEND

- ROUTE TO HOSPITAL
- PROJECT SITE BOUNDARY
- HOSPITAL LOCATION

Woodhull Medical Center
760 Broadway
Brooklyn, NY 11206

0 1,500 3,000
SCALE IN FEET

©2020 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\GIS\11259 Hospital Route Map.mxd 3/5/2020 1:35:17 PM mvilleux

AKRF
440 Park Avenue South, New York, NY 10016

34 Berry Street
Brooklyn, New York

HOSPITAL ROUTE MAP

DATE
3/5/2020

PROJECT NO.
11259

FIGURE
1

APPENDIX A

POTENTIAL HEALTH EFFECTS FROM ON-SITE CONTAMINANTS

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

1,2-DICHLOROETHANE

CAS #107-06-2

Division of Toxicology ToxFAQs™ **September 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about 1,2-Dichloroethane. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to 1,2-dichloroethane usually occurs by breathing contaminated air in workplaces that use 1,2-dichloroethane. Breathing or ingesting high levels of 1,2-dichloroethane can cause damage to the nervous system, liver, kidneys, and lungs and may cause cancer. This substance has been found in at least 570 of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is 1,2-dichloroethane?

1,2-Dichloroethane, also called ethylene dichloride, is a manufactured chemical that is not found naturally in the environment. It is a clear liquid and has a pleasant smell and sweet taste.

The most common use of 1,2-dichloroethane is in the production of vinyl chloride which is used to make a variety of plastic and vinyl products including polyvinyl chloride (PVC) pipes, furniture and automobile upholstery, wall coverings, housewares, and automobile parts. It is also used to as a solvent and is added to leaded gasoline to remove lead.

What happens to 1,2-dichloroethane when it enters the environment?

❑ Most of the 1,2-dichloroethane released to the environment is released to the air. In the air, 1,2-dichloroethane breaks down by reacting with other compounds formed by sunlight. It can stay in the air for more than 5 months before it is broken down.
❑ 1,2-Dichloroethane can also be released into rivers and lakes. It breaks down very slowly in water and most of it will evaporate to the air.
❑ 1,2-Dichloroethane released in soil will either evaporate into the air or travel down through the soil and enter underground water.

How might I be exposed to 1,2-dichloroethane?

❑ The general population may be exposed to 1,2-dichloroethane by breathing air or drinking water that contains 1,2-dichloroethane.
❑ People who work or live near a factory where 1,2-dichloroethane is used, may be exposed to higher than usual levels.
❑ People living near uncontrolled hazardous waste sites may also be exposed to higher than usual levels of 1,2-dichloroethane.

How can 1,2-dichloroethane affect my health?

Nervous system disorders, liver and kidney diseases, and lung effects have been reported in humans ingesting or inhaling large amounts of 1,2-dichloroethane.

In laboratory animals, breathing or ingesting large amounts of 1,2-dichloroethane have also caused nervous system disorders and liver, kidney, and lung effects. Animal studies also suggest that 1,2-dichloroethane may damage the

immune system. Kidney disease has also been seen in animals ingesting low doses of 1,2-dichloroethane for a long time. Studies in animals indicate that 1,2-dichloroethane does not affect reproduction.

How likely is 1,2-dichloroethane to cause cancer?

Human studies examining whether 1,2-dichloroethane can cause cancer have been considered inadequate. In animals, increases in the occurrence of stomach, mammary gland, liver, lung, and endometrium cancers have been seen following inhalation, oral, and dermal exposure.

The Department of Health and Human Services (DHHS) has determined that 1,2-dichloroethane may reasonably be expected to cause cancer. The EPA has determined that 1,2-dichloroethane is a probable human carcinogen and the International Agency for Cancer Research (IARC) considers it to be a possible human carcinogen.

How can 1,2-dichloroethane affect children?

We do not know if exposure to 1,2-dichloroethane will result in birth defects or other developmental effects in people. Studies in animals suggest that 1,2-dichloroethane does not produce birth defects.

It is likely that health effects seen in children exposed to high levels of 1,2-dichloroethane will be similar to the effects seen in adults.

How can families reduce the risk of exposure to 1,2-dichloroethane?

The general population is not likely to be exposed to large amounts of 1,2-dichloroethane. In the past, it was used in small amounts in household products such as cleaning agents, pesticides, and wallpaper and carpet glue. Risk of exposure from this source could be eliminated if these older products were immediately discarded.

Children should avoid playing in soils near uncontrolled hazardous waste sites where 1,2-dichloroethane may have been discarded.

Is there a medical test to show whether I've been exposed to 1,2-dichloroethane?

Tests are available to measure 1,2-dichloroethane in breath, blood, breast milk, and urine of exposed people. Because 1,2-dichloroethane leaves the body fairly quickly, these tests need to be done within a couple of days of exposure. These tests cannot be used to predict the nature or severity of toxic effects. These tests are not usually done in the doctor's office.

Has the federal government made recommendations to protect human health?

The EPA allows 0.005 milligrams of 1,2-dichloroethane per liter of drinking water (0.005 mg/L).

The Occupational Safety and Health Administration has set a limit of 50 parts of 1,2-dichloroethane per million parts of air (50 ppm) in workplace air for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2001. Toxicological Profile for 1,2-Dichloroethane. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

BENZENE
CAS # 71-43-2

This fact sheet answers the most frequently asked health questions (FAQs) about benzene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Benzene is a widely used chemical formed from both natural processes and human activities. Breathing benzene can cause drowsiness, dizziness, and unconsciousness; long-term benzene exposure causes effects on the bone marrow and can cause anemia and leukemia. Benzene has been found in at least 813 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is benzene?

(Pronounced bĕn′zēn′)

Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Benzene is widely used in the United States; it ranks in the top 20 chemicals for production volume. Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

What happens to benzene when it enters the environment?

- Industrial processes are the main source of benzene in the environment.
- Benzene can pass into the air from water and soil.
- It reacts with other chemicals in the air and breaks down within a few days.
- Benzene in the air can attach to rain or snow and be carried back down to the ground.
- It breaks down more slowly in water and soil, and can pass through the soil into underground water.
- Benzene does not build up in plants or animals.

How might I be exposed to benzene?

- Outdoor air contains low levels of benzene from tobacco smoke, automobile service stations, exhaust from motor vehicles, and industrial emissions.
- Indoor air generally contains higher levels of benzene from products that contain it such as glues, paints, furniture wax, and detergents.
- Air around hazardous waste sites or gas stations will contain higher levels of benzene.
- Leakage from underground storage tanks or from hazardous waste sites containing benzene can result in benzene contamination of well water.
- People working in industries that make or use benzene may be exposed to the highest levels of it.
- A major source of benzene exposures is tobacco smoke.

How can benzene affect my health?

Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

The major effect of benzene from long-term (365 days or longer) exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men.

Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene.

How likely is benzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.

Is there a medical test to show whether I've been exposed to benzene?

Several tests can show if you have been exposed to benzene. There is test for measuring benzene in the breath; this test must be done shortly after exposure. Benzene can also be measured in the blood, however, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene is converted to products called metabolites. Certain metabolites can be measured in the urine. However, this test must be done shortly after exposure and is not a reliable indicator of how much benzene you have been exposed to, since the metabolites may be present in urine from other sources.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum permissible level of benzene in drinking water at 0.005 milligrams per liter (0.005 mgL). The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 1 part of benzene per million parts of air (1 ppm) in the workplace during an 8-hour workday, 40-hour workweek.

Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Chromosomes: Parts of the cells responsible for the development of hereditary characteristics.

Metabolites: Breakdown products of chemicals.

Milligram (mg): One thousandth of a gram.

Pesticide: A substance that kills pests.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Benzene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ETHYLBENZENE
CAS # 100-41-4

Agency for Toxic Substances and Disease Registry ToxFAQs **June 1999**

This fact sheet answers the most frequently asked health questions (FAQs) about ethylbenzene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Ethylbenzene is a colorless liquid found in a number of products including gasoline and paints. Breathing very high levels can cause dizziness and throat and eye irritation. Ethylbenzene has been found in at least 731 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is ethylbenzene?

(Pronounced ĕthʹ əl bĕnʹ zēnʹ)

Ethylbenzene is a colorless, flammable liquid that smells like gasoline. It is found in natural products such as coal tar and petroleum and is also found in manufactured products such as inks, insecticides, and paints.

Ethylbenzene is used primarily to make another chemical, styrene. Other uses include as a solvent, in fuels, and to make other chemicals.

What happens to ethylbenzene when it enters the environment?

- Ethylbenzene moves easily into the air from water and soil.
- It takes about 3 days for ethylbenzene to be broken down in air into other chemicals.
- Ethylbenzene may be released to water from industrial discharges or leaking underground storage tanks.
- In surface water, ethylbenzene breaks down by reacting with other chemicals found naturally in water.
- In soil, it is broken down by soil bacteria.

How might I be exposed to ethylbenzene?

- Breathing air containing ethylbenzene, particularly in areas near factories or highways.
- Drinking contaminated tap water.
- Working in an industry where ethylbenzene is used or made.
- Using products containing it, such as gasoline, carpet glues, varnishes, and paints.

How can ethylbenzene affect my health?

Limited information is available on the effects of ethylbenzene on people's health. The available information shows dizziness, throat and eye irritation, tightening of the chest, and a burning sensation in the eyes of people exposed to high levels of ethylbenzene in air.

Animals studies have shown effects on the nervous system, liver, kidneys, and eyes from breathing ethylbenzene in air.

How likely is ethylbenzene to cause cancer?

The EPA has determined that ethylbenzene is not classifiable as to human carcinogenicity.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

No studies in people have shown that ethylbenzene exposure can result in cancer. Two available animal studies suggest that ethylbenzene may cause tumors.

How can ethylbenzene affect children?

Children may be exposed to ethylbenzene through inhalation of consumer products, including gasoline, paints, inks, pesticides, and carpet glue. We do not know whether children are more sensitive to the effects of ethylbenzene than adults.

It is not known whether ethylbenzene can affect the development of the human fetus. Animal studies have shown that when pregnant animals were exposed to ethylbenzene in air, their babies had an increased number of birth defects.

How can families reduce the risk of exposure to ethylbenzene?

Exposure to ethylbenzene vapors from household products and newly installed carpeting can be minimized by using adequate ventilation.

Household chemicals should be stored out of reach of children to prevent accidental poisoning. Always store household chemicals in their original containers; never store them in containers children would find attractive to eat or drink from, such as old soda bottles. Gasoline should be stored in a gasoline can with a locked cap.

Sometimes older children sniff household chemicals, including ethylbenzene, in an attempt to get high. Talk with your children about the dangers of sniffing chemicals.

Is there a medical test to show whether I've been exposed to ethylbenzene?

Ethylbenzene is found in the blood, urine, breath, and some body tissues of exposed people. The most common way to test for ethylbenzene is in the urine. This test measures substances formed by the breakdown of ethylbenzene. This test needs to be done within a few hours after exposure occurs, because the substances leave the body very quickly.

These tests can show you were exposed to ethylbenzene, but cannot predict the kind of health effects that might occur.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level of 0.7 milligrams of ethylbenzene per liter of drinking water (0.7 mg/L).

The EPA requires that spills or accidental releases into the environment of 1,000 pounds or more of ethylbenzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set an occupational exposure limit of 100 parts of ethylbenzene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for ethylbenzene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

FUEL OILS

CAS # 8008-20-6, 70892-10-3, 68476-30-2, 68476-34-6, 68476-31-3

This fact sheet answers the most frequently asked health questions (FAQs) about fuel oils. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Fuel oils are liquid mixtures produced from petroleum, and their use mostly involves burning them as fuels. Drinking or breathing fuel oils may cause nausea or nervous system effects. However, exposure under normal use conditions is not likely to be harmful. Fuel oils have been found in at least 26 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are fuel oils?

(Pronounced fyo͞o′əl oilz)

Fuel oils are a variety of yellowish to light brown liquid mixtures that come from crude petroleum. Some chemicals found in fuel oils may evaporate easily, while others may more easily dissolve in water.

Fuel oils are produced by different petroleum refining processes, depending on their intended uses. Fuel oils may be used as fuel for engines, lamps, heaters, furnaces, and stoves, or as solvents.

Some commonly found fuel oils include kerosene, diesel fuel, jet fuel, range oil, and home heating oil. These fuel oils differ from one another by their hydrocarbon compositions, boiling point ranges, chemical additives, and uses.

What happens to fuel oils when they enter the environment?

- Some chemicals found in fuel oils may evaporate into the air from open containers or contaminated soil or water.
- Some chemicals found in fuel oils may dissolve in water after spills to surface waters or leaks from underground storage tanks.
- Some chemicals found in fuel oils may stick to particles in water, which will eventually cause them to settle to the bottom sediment.
- Some of the chemicals found in fuel oils may be broken down slowly in air, water, and soil by sunlight or small organisms.
- Some of the chemicals found in fuel oils may build up significantly in plants and animals.

How might I be exposed to fuel oils?

- Using a home kerosene heater or stove, or using fuel oils at work.
- Breathing air in home or building basements that has been contaminated with fuel oil vapors entering from the soil.
- Drinking or swimming in water that has been contaminated with fuel oils from a spill or a leaking underground storage tank.
- Touching soil contaminated with fuel oils.
- Using fuel oils to wash paint or grease from skin or equipment.

How can fuel oils affect my health?

Little information is available about the health effects that may be caused by fuel oils. People who use kerosene

stoves for cooking do not seem to have any health problems related to their exposure.

Breathing some fuel oils for short periods may cause nausea, eye irritation, increased blood pressure, headache, lightheadedness, loss of appetite, poor coordination, and difficulty concentrating. Breathing diesel fuel vapors for long periods may cause kidney damage and lower your blood's ability to clot.

Drinking small amounts of kerosene may cause vomiting, diarrhea, coughing, stomach swelling and cramps, drowsiness, restlessness, painful breathing, irritability, and unconsciousness. Drinking large amounts of kerosene may cause convulsions, coma, or death. Skin contact with kerosene for short periods may cause itchy, red, sore, or peeling skin.

How likely are fuel oils to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that some fuel oils (heavy) may possibly cause cancer in humans, but for other fuel oils (light) there is not enough information to make a determination. IARC has also determined that occupational exposures to fuel oils during petroleum refining are probably carcinogenic in humans.

Some studies with mice have suggested that repeated contact with fuel oils may cause liver or skin cancer. However, other mouse studies have found this not to be the case. No studies are available in other animals or in people on the carcinogenic effects of fuel oils.

Is there a medical test to show whether I've been exposed to fuel oils?

There is no medical test that shows if you have been exposed to fuel oils. Tests are available to determine if some of the chemicals commonly found in fuel oils are in your blood. However, the presence of these chemicals in blood may not necessarily mean that you have been exposed to fuel oils.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) and the Air Force Office of Safety and Health (AFOSH) have set a permissible exposure level (PEL) of 400 parts of petroleum distillates per million parts of air (400 ppm) for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that average workplace air levels not exceed 350 milligrams of petroleum distillates per cubic meter of air (350 mg/m^3) for a 40-hour workweek.

The Department of Transportation (DOT) lists fuel oils as hazardous materials and, therefore, regulates their transportation.

Glossary

Carcinogenic: Able to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or a gas.

Hydrocarbon: Any compound made up of hydrogen and carbon.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Sediment: Mud and debris that have settled to the bottom of a body of water.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for fuel oils. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

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POLYCHLORINATED BIPHENYLS

Division of Toxicology ToxFAQs™ **February 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about polychlorinated biphenyls. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Polychlorinated biphenyls (PCBs) are a mixture of individual chemicals which are no longer produced in the United States, but are still found in the environment. Health effects that have been associated with exposure to PCBs include acne-like skin conditions in adults and neurobehavioral and immunological changes in children. PCBs are known to cause cancer in animals. PCBs have been found in at least 500 of the 1,598 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are polychlorinated biphenyls?

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). There are no known natural sources of PCBs. PCBs are either oily liquids or solids that are colorless to light yellow. Some PCBs can exist as a vapor in air. PCBs have no known smell or taste. Many commercial PCB mixtures are known in the U.S. by the trade name Aroclor.

PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they don't burn easily and are good insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors, and old microscope and hydraulic oils.

What happens to PCBs when they enter the environment?

❑ PCBs entered the air, water, and soil during their manufacture, use, and disposal; from accidental spills and leaks during their transport; and from leaks or fires in products containing PCBs.

❑ PCBs can still be released to the environment from hazardous waste sites; illegal or improper disposal of industrial wastes and consumer products; leaks from old electrical transformers containing PCBs; and burning of some wastes in incinerators.

❑ PCBs do not readily break down in the environment and thus may remain there for very long periods of time. PCBs can travel long distances in the air and be deposited in areas far away from where they were released. In water, a small amount of PCBs may remain dissolved, but most stick to organic particles and bottom sediments. PCBs also bind strongly to soil.

❑ PCBs are taken up by small organisms and fish in water. They are also taken up by other animals that eat these aquatic animals as food. PCBs accumulate in fish and marine mammals, reaching levels that may be many thousands of times higher than in water.

How might I be exposed to PCBs?

❑ Using old fluorescent lighting fixtures and electrical devices and appliances, such as television sets and refrigerators, that were made 30 or more years ago. These items may leak small amounts of PCBs into the air when they get hot during operation, and could be a source of skin exposure.

❑ Eating contaminated food. The main dietary sources of PCBs are fish (especially sportfish caught in contaminated lakes or rivers), meat, and dairy products.

❑ Breathing air near hazardous waste sites and drinking contaminated well water.

❑ In the workplace during repair and maintenance of PCB transformers; accidents, fires or spills involving transformers, fluorescent lights, and other old electrical devices; and disposal of PCB materials.

How can PCBs affect my health?

The most commonly observed health effects in people exposed to large amounts of PCBs are skin conditions such as acne and rashes. Studies in exposed workers have shown changes in blood and urine that may indicate liver damage. PCB exposures in the general population are not likely to result in skin and liver effects. Most of the studies of health effects of PCBs in the general population examined children of mothers who were exposed to PCBs.

Animals that ate food containing large amounts of PCBs for short periods of time had mild liver damage and some died. Animals that ate smaller amounts of PCBs in food over several weeks or months developed various kinds of health effects, including anemia; acne-like skin conditions; and liver, stomach, and thyroid gland injuries. Other effects

of PCBs in animals include changes in the immune system, behavioral alterations, and impaired reproduction. PCBs are not known to cause birth defects.

How likely are PCBs to cause cancer?

Few studies of workers indicate that PCBs were associated with certain kinds of cancer in humans, such as cancer of the liver and biliary tract. Rats that ate food containing high levels of PCBs for two years developed liver cancer. The Department of Health and Human Services (DHHS) has concluded that PCBs may reasonably be anticipated to be carcinogens. The EPA and the International Agency for Research on Cancer (IARC) have determined that PCBs are probably carcinogenic to humans.

How can PCBs affect children?

Women who were exposed to relatively high levels of PCBs in the workplace or ate large amounts of fish contaminated with PCBs had babies that weighed slightly less than babies from women who did not have these exposures. Babies born to women who ate PCB-contaminated fish also showed abnormal responses in tests of infant behavior. Some of these behaviors, such as problems with motor skills and a decrease in short-term memory, lasted for several years. Other studies suggest that the immune system was affected in children born to and nursed by mothers exposed to increased levels of PCBs. There are no reports of structural birth defects caused by exposure to PCBs or of health effects of PCBs in older children. The most likely way infants will be exposed to PCBs is from breast milk. Transplacental transfers of PCBs were also reported In most cases, the benefits of breast-feeding outweigh any risks from exposure to PCBs in mother's milk.

How can families reduce the risk of exposure to PCBs?

❑ You and your children may be exposed to PCBs by eating fish or wildlife caught from contaminated locations. Certain states, Native American tribes, and U.S. territories have issued advisories to warn people about PCB-contaminated fish and fish-eating wildlife. You can reduce your family's exposure to PCBs by obeying these advisories.

❑ Children should be told not play with old appliances, electrical equipment, or transformers, since they may contain PCBs.

❑ Children should be discouraged from playing in the dirt near hazardous waste sites and in areas where there was a transformer fire. Children should also be discouraged from eating dirt and putting dirty hands, toys or other objects in their mouths, and should wash hands frequently.

❑ If you are exposed to PCBs in the workplace it is possible to carry them home on your clothes, body, or tools. If this is the case, you should shower and change clothing before leaving work, and your work clothes should be kept separate from other clothes and laundered separately.

Is there a medical test to show whether I've been exposed to PCBs?

Tests exist to measure levels of PCBs in your blood, body fat, and breast milk, but these are not routinely conducted. Most people normally have low levels of PCBs in their body because nearly everyone has been environmentally exposed to PCBs. The tests can show if your PCB levels are elevated, which would indicate past exposure to above-normal levels of PCBs, but cannot determine when or how long you were exposed or whether you will develop health effects.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 0.0005 milligrams of PCBs per liter of drinking water (0.0005 mg/L). Discharges, spills or accidental releases of 1 pound or more of PCBs into the environment must be reported to the EPA. The Food and Drug Administration (FDA) requires that infant foods, eggs, milk and other dairy products, fish and shellfish, poultry and red meat contain no more than 0.2-3 parts of PCBs per million parts (0.2-3 ppm) of food. Many states have established fish and wildlife consumption advisories for PCBs.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological profile for polychlorinated biphenyls (PCBs). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TOLUENE
CAS # 108-88-3

Division of Toxicology ToxFAQs™ **February 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about toluene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to toluene occurs from breathing contaminated workplace air, in automobile exhaust, some consumer products paints, paint thinners, fingernail polish, lacquers, and adhesives. Toluene affects the nervous system. Toluene has been found at 959 of the 1,591 National Priority List sites identified by the Environmental Protection Agency

What is toluene?

Toluene is a clear, colorless liquid with a distinctive smell. Toluene occurs naturally in crude oil and in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and making coke from coal.

Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes.

What happens to toluene when it enters the environment?

❑ Toluene enters the environment when you use materials that contain it. It can also enter surface water and groundwater from spills of solvents and petrolieum products as well as from leasking underground storage tanks at gasoline stations and other facilities.

❑ When toluene-containing products are placed in landfills or waste disposal sites, the toluene can enter the soil or water near the waste site.

❑ Toluene does not usually stay in the environment long.

❑ Toluene does not concentrate or buildup to high levels in animals.

How might I be exposed to toluene?

❑ Breathing contaminated workplace air or automobile exhaust.

❑ Working with gasoline, kerosene, heating oil, paints, and lacquers.

❑ Drinking contaminated well-water.

❑ Living near uncontrolled hazardous waste sites containing toluene products.

How can toluene affect my health?

Toluene may affect the nervous system. Low to moderate levles can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite, and

hearing and color vision loss. These symptoms usually disappear when exposure is stopped.

Inhaling High levels of toluene in a short time can make you feel light-headed, dizzy, or sleepy. It can also cause unconsciousness, and even death.

High levels of toluene may affect your kidneys.

How likely is toluene to cause cancer?

Studies in humans and animals generally indicate that toluene does not cause cancer.

The EPA has determined that the carcinogenicity of toluene can not be classified.

How can toluene affect children?

It is likely that health effects seen in children exposed to toluene will be similar to the effects seen in adults. Some studies in animals suggest that babies may be more sensitive than adults.

Breathing very high levels of toluene during pregnancy can result in children with birth defects and retard mental abilities, and growth. We do not know if toluene harms the unborn child if the mother is exposed to low levels of toluene during pregnancy.

How can families reduce the risk of exposure to toluene?

❑ Use toluene-containing products in well-ventilated areas.

❑ When not in use, toluene-containing products should be tightly covered to prevent evaporation into the air.

Is there a medical test to show whether I've been exposed to toluene?

There are tests to measure the level of toluene or its breakdown products in exhaled air, urine, and blood. To determine if you have been exposed to toluene, your urine or blood must be checked within 12 hours of exposure. Several other chemicals are also changed into the same breakdown products as toluene, so some of these tests are not specific for toluene.

Has the federal government made recommendations to protect human health?

EPA has set a limit of 1 milligram per liter of drinking water (1 mg/L).

Discharges, releases, or spills of more than 1,000 pounds of toluene must be reported to the National Response Center.

The Occupational Safety and Health Administration has set a limit of 200 parts toluene per million of workplace air (200 ppm).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for Toluene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

XYLENE
CAS # 1330-20-7

This fact sheet answers the most frequently asked health questions (FAQs) about xylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to xylene occurs in the workplace and when you use paint, gasoline, paint thinners and other products that contain it. People who breathe high levels may have dizziness, confusion, and a change in their sense of balance. This substance has been found in at least 658 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is xylene?

(Pronounced zī′lēn)

Xylene is a colorless, sweet-smelling liquid that catches on fire easily. It occurs naturally in petroleum and coal tar and is formed during forest fires. You can smell xylene in air at 0.08–3.7 parts of xylene per million parts of air (ppm) and begin to taste it in water at 0.53–1.8 ppm.

Chemical industries produce xylene from petroleum. It's one of the top 30 chemicals produced in the United States in terms of volume.

Xylene is used as a solvent and in the printing, rubber, and leather industries. It is also used as a cleaning agent, a thinner for paint, and in paints and varnishes. It is found in small amounts in airplane fuel and gasoline.

What happens to xylene when it enters the environment?

- Xylene has been found in waste sites and landfills when discarded as used solvent, or in varnish, paint, or paint thinners.
- It evaporates quickly from the soil and surface water into the air.
- In the air, it is broken down by sunlight into other less harmful chemicals.
- It is broken down by microorganisms in soil and water.
- Only a small amount of it builds up in fish, shellfish, plants, and animals living in xylene-contaminated water.

How might I be exposed to xylene?

- Breathing xylene in workplace air or in automobile exhaust.
- Breathing contaminated air.
- Touching gasoline, paint, paint removers, varnish, shellac, and rust preventatives that contain it.
- Breathing cigarette smoke that has small amounts of xylene in it.
- Drinking contaminated water or breathing air near waste sites and landfills that contain xylene.
- The amount of xylene in food is likely to be low.

How can xylene affect my health?

Xylene affects the brain. High levels from exposure for short periods (14 days or less) or long periods (more than 1 year) can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of

people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

Studies of unborn animals indicate that high concentrations of xylene may cause increased numbers of deaths, and delayed growth and development. In many instances, these same concentrations also cause damage to the mothers. We do not know if xylene harms the unborn child if the mother is exposed to low levels of xylene during pregnancy.

How likely is xylene to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that xylene is not classifiable as to its carcinogenicity in humans.

Human and animal studies have not shown xylene to be carcinogenic, but these studies are not conclusive and do not provide enough information to conclude that xylene does not cause cancer.

Is there a medical test to show whether I've been exposed to xylene?

Laboratory tests can detect xylene or its breakdown products in exhaled air, blood, or urine. There is a high degree of agreement between the levels of exposure to xylene and the levels of xylene breakdown products in the urine. However, a urine sample must be provided very soon after exposure ends because xylene quickly leaves the body. These tests are not routinely available at your doctor's office.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 10 ppm of xylene in drinking water.

The EPA requires that spills or accidental releases of xylenes into the environment of 1,000 pounds or more must be reported.

The Occupational Safety and Health Administration (OSHA) has set a maximum level of 100 ppm xylene in workplace air for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) also recommend exposure limits of 100 ppm in workplace air.

NIOSH has recommended that 900 ppm of xylene be considered immediately dangerous to life or health. This is the exposure level of a chemical that is likely to cause permanent health problems or death.

Glossary

Evaporate: To change from a liquid into a vapor or a gas.

Carcinogenic: Having the ability to cause cancer.

CAS: Chemical Abstracts Service.

ppm: Parts per million.

Solvent: A liquid that can dissolve other substances.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for xylenes (update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

1,2-DICHLOROETHANE

CAS #107-06-2

Division of Toxicology ToxFAQs™ **September 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about 1,2-Dichloroethane. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to 1,2-dichloroethane usually occurs by breathing contaminated air in workplaces that use 1,2-dichloroethane. Breathing or ingesting high levels of 1,2-dichloroethane can cause damage to the nervous system, liver, kidneys, and lungs and may cause cancer. This substance has been found in at least 570 of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is 1,2-dichloroethane?

1,2-Dichloroethane, also called ethylene dichloride, is a manufactured chemical that is not found naturally in the environment. It is a clear liquid and has a pleasant smell and sweet taste.

The most common use of 1,2-dichloroethane is in the production of vinyl chloride which is used to make a variety of plastic and vinyl products including polyvinyl chloride (PVC) pipes, furniture and automobile upholstery, wall coverings, housewares, and automobile parts. It is also used to as a solvent and is added to leaded gasoline to remove lead.

What happens to 1,2-dichloroethane when it enters the environment?

❑ Most of the 1,2-dichloroethane released to the environment is released to the air. In the air, 1,2-dichloroethane breaks down by reacting with other compounds formed by sunlight. It can stay in the air for more than 5 months before it is broken down.
❑ 1,2-Dichloroethane can also be released into rivers and lakes. It breaks down very slowly in water and most of it will evaporate to the air.
❑ 1,2-Dichloroethane released in soil will either evaporate into the air or travel down through the soil and enter underground water.

How might I be exposed to 1,2-dichloroethane?

❑ The general population may be exposed to 1,2-dichloroethane by breathing air or drinking water that contains 1,2-dichloroethane.
❑ People who work or live near a factory where 1,2-dichloroethane is used, may be exposed to higher than usual levels.
❑ People living near uncontrolled hazardous waste sites may also be exposed to higher than usual levels of 1,2-dichloroethane.

How can 1,2-dichloroethane affect my health?

Nervous system disorders, liver and kidney diseases, and lung effects have been reported in humans ingesting or inhaling large amounts of 1,2-dichloroethane.

In laboratory animals, breathing or ingesting large amounts of 1,2-dichloroethane have also caused nervous system disorders and liver, kidney, and lung effects. Animal studies also suggest that 1,2-dichloroethane may damage the

immune system. Kidney disease has also been seen in animals ingesting low doses of 1,2-dichloroethane for a long time. Studies in animals indicate that 1,2-dichloroethane does not affect reproduction.

How likely is 1,2-dichloroethane to cause cancer?

Human studies examining whether 1,2-dichloroethane can cause cancer have been considered inadequate. In animals, increases in the occurrence of stomach, mammary gland, liver, lung, and endometrium cancers have been seen following inhalation, oral, and dermal exposure.

The Department of Health and Human Services (DHHS) has determined that 1,2-dichloroethane may reasonably be expected to cause cancer. The EPA has determined that 1,2-dichloroethane is a probable human carcinogen and the International Agency for Cancer Research (IARC) considers it to be a possible human carcinogen.

How can 1,2-dichloroethane affect children?

We do not know if exposure to 1,2-dichloroethane will result in birth defects or other developmental effects in people. Studies in animals suggest that 1,2-dichloroethane does not produce birth defects.

It is likely that health effects seen in children exposed to high levels of 1,2-dichloroethane will be similar to the effects seen in adults.

How can families reduce the risk of exposure to 1,2-dichloroethane?

The general population is not likely to be exposed to large amounts of 1,2-dichloroethane. In the past, it was used in small amounts in household products such as cleaning agents, pesticides, and wallpaper and carpet glue. Risk of exposure from this source could be eliminated if these older products were immediately discarded.

Children should avoid playing in soils near uncontrolled hazardous waste sites where 1,2-dichloroethane may have been discarded.

Is there a medical test to show whether I've been exposed to 1,2-dichloroethane?

Tests are available to measure 1,2-dichloroethane in breath, blood, breast milk, and urine of exposed people. Because 1,2-dichloroethane leaves the body fairly quickly, these tests need to be done within a couple of days of exposure. These tests cannot be used to predict the nature or severity of toxic effects. These tests are not usually done in the doctor's office.

Has the federal government made recommendations to protect human health?

The EPA allows 0.005 milligrams of 1,2-dichloroethane per liter of drinking water (0.005 mg/L).

The Occupational Safety and Health Administration has set a limit of 50 parts of 1,2-dichloroethane per million parts of air (50 ppm) in workplace air for 8 hour shifts and 40 hour work weeks.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2001. Toxicological Profile for 1,2-Dichloroethane. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

BENZENE
CAS # 71-43-2

This fact sheet answers the most frequently asked health questions (FAQs) about benzene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Benzene is a widely used chemical formed from both natural processes and human activities. Breathing benzene can cause drowsiness, dizziness, and unconsciousness; long-term benzene exposure causes effects on the bone marrow and can cause anemia and leukemia. Benzene has been found in at least 813 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is benzene?

(Pronounced bĕn′zēn′)

Benzene is a colorless liquid with a sweet odor. It evaporates into the air very quickly and dissolves slightly in water. It is highly flammable and is formed from both natural processes and human activities.

Benzene is widely used in the United States; it ranks in the top 20 chemicals for production volume. Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke.

What happens to benzene when it enters the environment?

- Industrial processes are the main source of benzene in the environment.
- Benzene can pass into the air from water and soil.
- It reacts with other chemicals in the air and breaks down within a few days.
- Benzene in the air can attach to rain or snow and be carried back down to the ground.
- It breaks down more slowly in water and soil, and can pass through the soil into underground water.
- Benzene does not build up in plants or animals.

How might I be exposed to benzene?

- Outdoor air contains low levels of benzene from tobacco smoke, automobile service stations, exhaust from motor vehicles, and industrial emissions.
- Indoor air generally contains higher levels of benzene from products that contain it such as glues, paints, furniture wax, and detergents.
- Air around hazardous waste sites or gas stations will contain higher levels of benzene.
- Leakage from underground storage tanks or from hazardous waste sites containing benzene can result in benzene contamination of well water.
- People working in industries that make or use benzene may be exposed to the highest levels of it.
- A major source of benzene exposures is tobacco smoke.

How can benzene affect my health?

Breathing very high levels of benzene can result in death, while high levels can cause drowsiness, dizziness, rapid heart rate, headaches, tremors, confusion, and unconsciousness. Eating or drinking foods containing high levels of benzene can cause vomiting, irritation of the stomach, dizziness, sleepiness, convulsions, rapid heart rate, and death.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

The major effect of benzene from long-term (365 days or longer) exposure is on the blood. Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection.

Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. It is not known whether benzene exposure affects the developing fetus in pregnant women or fertility in men.

Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene.

How likely is benzene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that benzene is a known human carcinogen. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs.

Is there a medical test to show whether I've been exposed to benzene?

Several tests can show if you have been exposed to benzene. There is test for measuring benzene in the breath; this test must be done shortly after exposure. Benzene can also be measured in the blood, however, since benzene disappears rapidly from the blood, measurements are accurate only for recent exposures.

In the body, benzene is converted to products called metabolites. Certain metabolites can be measured in the urine. However, this test must be done shortly after exposure and is not a reliable indicator of how much benzene you have been exposed to, since the metabolites may be present in urine from other sources.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum permissible level of benzene in drinking water at 0.005 milligrams per liter (0.005 mgL). The EPA requires that spills or accidental releases into the environment of 10 pounds or more of benzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit of 1 part of benzene per million parts of air (1 ppm) in the workplace during an 8-hour workday, 40-hour workweek.

Glossary

Anemia: A decreased ability of the blood to transport oxygen.

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Chromosomes: Parts of the cells responsible for the development of hereditary characteristics.

Metabolites: Breakdown products of chemicals.

Milligram (mg): One thousandth of a gram.

Pesticide: A substance that kills pests.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Benzene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

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AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

ETHYLBENZENE
CAS # 100-41-4

Agency for Toxic Substances and Disease Registry ToxFAQs **June 1999**

This fact sheet answers the most frequently asked health questions (FAQs) about ethylbenzene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Ethylbenzene is a colorless liquid found in a number of products including gasoline and paints. Breathing very high levels can cause dizziness and throat and eye irritation. Ethylbenzene has been found in at least 731 of the 1,467 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is ethylbenzene?

(Pronounced ĕthʹ əl bĕnʹ zēnʹ)

Ethylbenzene is a colorless, flammable liquid that smells like gasoline. It is found in natural products such as coal tar and petroleum and is also found in manufactured products such as inks, insecticides, and paints.

Ethylbenzene is used primarily to make another chemical, styrene. Other uses include as a solvent, in fuels, and to make other chemicals.

What happens to ethylbenzene when it enters the environment?

- Ethylbenzene moves easily into the air from water and soil.
- It takes about 3 days for ethylbenzene to be broken down in air into other chemicals.
- Ethylbenzene may be released to water from industrial discharges or leaking underground storage tanks.
- In surface water, ethylbenzene breaks down by reacting with other chemicals found naturally in water.
- In soil, it is broken down by soil bacteria.

How might I be exposed to ethylbenzene?

- Breathing air containing ethylbenzene, particularly in areas near factories or highways.
- Drinking contaminated tap water.
- Working in an industry where ethylbenzene is used or made.
- Using products containing it, such as gasoline, carpet glues, varnishes, and paints.

How can ethylbenzene affect my health?

Limited information is available on the effects of ethylbenzene on people's health. The available information shows dizziness, throat and eye irritation, tightening of the chest, and a burning sensation in the eyes of people exposed to high levels of ethylbenzene in air.

Animals studies have shown effects on the nervous system, liver, kidneys, and eyes from breathing ethylbenzene in air.

How likely is ethylbenzene to cause cancer?

The EPA has determined that ethylbenzene is not classifiable as to human carcinogenicity.

ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html

No studies in people have shown that ethylbenzene exposure can result in cancer. Two available animal studies suggest that ethylbenzene may cause tumors.

How can ethylbenzene affect children?

Children may be exposed to ethylbenzene through inhalation of consumer products, including gasoline, paints, inks, pesticides, and carpet glue. We do not know whether children are more sensitive to the effects of ethylbenzene than adults.

It is not known whether ethylbenzene can affect the development of the human fetus. Animal studies have shown that when pregnant animals were exposed to ethylbenzene in air, their babies had an increased number of birth defects.

How can families reduce the risk of exposure to ethylbenzene?

Exposure to ethylbenzene vapors from household products and newly installed carpeting can be minimized by using adequate ventilation.

Household chemicals should be stored out of reach of children to prevent accidental poisoning. Always store household chemicals in their original containers; never store them in containers children would find attractive to eat or drink from, such as old soda bottles. Gasoline should be stored in a gasoline can with a locked cap.

Sometimes older children sniff household chemicals, including ethylbenzene, in an attempt to get high. Talk with your children about the dangers of sniffing chemicals.

Is there a medical test to show whether I've been exposed to ethylbenzene?

Ethylbenzene is found in the blood, urine, breath, and some body tissues of exposed people. The most common way to test for ethylbenzene is in the urine. This test measures substances formed by the breakdown of ethylbenzene. This test needs to be done within a few hours after exposure occurs, because the substances leave the body very quickly.

These tests can show you were exposed to ethylbenzene, but cannot predict the kind of health effects that might occur.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level of 0.7 milligrams of ethylbenzene per liter of drinking water (0.7 mg/L).

The EPA requires that spills or accidental releases into the environment of 1,000 pounds or more of ethylbenzene be reported to the EPA.

The Occupational Safety and Health Administration (OSHA) has set an occupational exposure limit of 100 parts of ethylbenzene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for ethylbenzene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TOLUENE
CAS # 108-88-3

Division of Toxicology ToxFAQs™ **February 2001**

This fact sheet answers the most frequently asked health questions (FAQs) about toluene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to toluene occurs from breathing contaminated workplace air, in automobile exhaust, some consumer products paints, paint thinners, fingernail polish, lacquers, and adhesives. Toluene affects the nervous system. Toluene has been found at 959 of the 1,591 National Priority List sites identified by the Environmental Protection Agency

What is toluene?

Toluene is a clear, colorless liquid with a distinctive smell. Toluene occurs naturally in crude oil and in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and making coke from coal.

Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes.

What happens to toluene when it enters the environment?

❑ Toluene enters the environment when you use materials that contain it. It can also enter surface water and groundwater from spills of solvents and petrolieum products as well as from leasking underground storage tanks at gasoline stations and other facilities.

❑ When toluene-containing products are placed in landfills or waste disposal sites, the toluene can enter the soil or water near the waste site.

❑ Toluene does not usually stay in the environment long.

❑ Toluene does not concentrate or buildup to high levels in animals.

How might I be exposed to toluene?

❑ Breathing contaminated workplace air or automobile exhaust.

❑ Working with gasoline, kerosene, heating oil, paints, and lacquers.

❑ Drinking contaminated well-water.

❑ Living near uncontrolled hazardous waste sites containing toluene products.

How can toluene affect my health?

Toluene may affect the nervous system. Low to moderate levles can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite, and

hearing and color vision loss. These symptoms usually disappear when exposure is stopped.

Inhaling High levels of toluene in a short time can make you feel light-headed, dizzy, or sleepy. It can also cause unconsciousness, and even death.

High levels of toluene may affect your kidneys.

How likely is toluene to cause cancer?

Studies in humans and animals generally indicate that toluene does not cause cancer.

The EPA has determined that the carcinogenicity of toluene can not be classified.

How can toluene affect children?

It is likely that health effects seen in children exposed to toluene will be similar to the effects seen in adults. Some studies in animals suggest that babies may be more sensitive than adults.

Breathing very high levels of toluene during pregnancy can result in children with birth defects and retard mental abilities, and growth. We do not know if toluene harms the unborn child if the mother is exposed to low levels of toluene during pregnancy.

How can families reduce the risk of exposure to toluene?

❑ Use toluene-containing products in well-ventilated areas.

❑ When not in use, toluene-containing products should be tightly covered to prevent evaporation into the air.

Is there a medical test to show whether I've been exposed to toluene?

There are tests to measure the level of toluene or its breakdown products in exhaled air, urine, and blood. To determine if you have been exposed to toluene, your urine or blood must be checked within 12 hours of exposure. Several other chemicals are also changed into the same breakdown products as toluene, so some of these tests are not specific for toluene.

Has the federal government made recommendations to protect human health?

EPA has set a limit of 1 milligram per liter of drinking water (1 mg/L).

Discharges, releases, or spills of more than 1,000 pounds of toluene must be reported to the National Response Center.

The Occupational Safety and Health Administration has set a limit of 200 parts toluene per million of workplace air (200 ppm).

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2000. Toxicological Profile for Toluene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

XYLENE
CAS # 1330-20-7

This fact sheet answers the most frequently asked health questions (FAQs) about xylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to xylene occurs in the workplace and when you use paint, gasoline, paint thinners and other products that contain it. People who breathe high levels may have dizziness, confusion, and a change in their sense of balance. This substance has been found in at least 658 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is xylene?

(Pronounced zī′lēn)

Xylene is a colorless, sweet-smelling liquid that catches on fire easily. It occurs naturally in petroleum and coal tar and is formed during forest fires. You can smell xylene in air at 0.08–3.7 parts of xylene per million parts of air (ppm) and begin to taste it in water at 0.53–1.8 ppm.

Chemical industries produce xylene from petroleum. It's one of the top 30 chemicals produced in the United States in terms of volume.

Xylene is used as a solvent and in the printing, rubber, and leather industries. It is also used as a cleaning agent, a thinner for paint, and in paints and varnishes. It is found in small amounts in airplane fuel and gasoline.

What happens to xylene when it enters the environment?

- Xylene has been found in waste sites and landfills when discarded as used solvent, or in varnish, paint, or paint thinners.
- It evaporates quickly from the soil and surface water into the air.
- In the air, it is broken down by sunlight into other less harmful chemicals.
- It is broken down by microorganisms in soil and water.
- Only a small amount of it builds up in fish, shellfish, plants, and animals living in xylene-contaminated water.

How might I be exposed to xylene?

- Breathing xylene in workplace air or in automobile exhaust.
- Breathing contaminated air.
- Touching gasoline, paint, paint removers, varnish, shellac, and rust preventatives that contain it.
- Breathing cigarette smoke that has small amounts of xylene in it.
- Drinking contaminated water or breathing air near waste sites and landfills that contain xylene.
- The amount of xylene in food is likely to be low.

How can xylene affect my health?

Xylene affects the brain. High levels from exposure for short periods (14 days or less) or long periods (more than 1 year) can cause headaches, lack of muscle coordination, dizziness, confusion, and changes in one's sense of balance. Exposure of

people to high levels of xylene for short periods can also cause irritation of the skin, eyes, nose, and throat; difficulty in breathing; problems with the lungs; delayed reaction time; memory difficulties; stomach discomfort; and possibly changes in the liver and kidneys. It can cause unconsciousness and even death at very high levels.

Studies of unborn animals indicate that high concentrations of xylene may cause increased numbers of deaths, and delayed growth and development. In many instances, these same concentrations also cause damage to the mothers. We do not know if xylene harms the unborn child if the mother is exposed to low levels of xylene during pregnancy.

How likely is xylene to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that xylene is not classifiable as to its carcinogenicity in humans.

Human and animal studies have not shown xylene to be carcinogenic, but these studies are not conclusive and do not provide enough information to conclude that xylene does not cause cancer.

Is there a medical test to show whether I've been exposed to xylene?

Laboratory tests can detect xylene or its breakdown products in exhaled air, blood, or urine. There is a high degree of agreement between the levels of exposure to xylene and the levels of xylene breakdown products in the urine. However, a urine sample must be provided very soon after exposure ends because xylene quickly leaves the body. These tests are not routinely available at your doctor's office.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 10 ppm of xylene in drinking water.

The EPA requires that spills or accidental releases of xylenes into the environment of 1,000 pounds or more must be reported.

The Occupational Safety and Health Administration (OSHA) has set a maximum level of 100 ppm xylene in workplace air for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) and the American Conference of Governmental Industrial Hygienists (ACGIH) also recommend exposure limits of 100 ppm in workplace air.

NIOSH has recommended that 900 ppm of xylene be considered immediately dangerous to life or health. This is the exposure level of a chemical that is likely to cause permanent health problems or death.

Glossary

Evaporate: To change from a liquid into a vapor or a gas.

Carcinogenic: Having the ability to cause cancer.

CAS: Chemical Abstracts Service.

ppm: Parts per million.

Solvent: A liquid that can dissolve other substances.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for xylenes (update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

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NAPHTHALENE
CAS # 91-20-3

1-METHYLNAPHTHALENE
CAS # 90-12-0

2-METHYLNAPHTHALENE
CAS # 91-57-6

Division of Toxicology ToxFAQs™ **August 2005**

This fact sheet answers the most frequently asked health questions (FAQs) about naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because these substances may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene happens mostly from breathing air contaminated from the burning of wood, tobacco, or fossil fuels, industrial discharges, or moth repellents. Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. Naphthalene has caused cancer in animals. Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene have been found in at least 687, 36, and 412, respectively, of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What are naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

Naphthalene is a white solid that evaporates easily. Fuels such as petroleum and coal contain naphthalene. It is also called white tar, and tar camphor, and has been used in mothballs and moth flakes. Burning tobacco or wood produces naphthalene. It has a strong, but not unpleasant smell. The major commercial use of naphthalene is in the manufacture of polyvinyl chloride (PVC) plastics. Its major consumer use is in moth repellents and toilet deodorant blocks.

1-Methylnaphthalene and 2-methylnaphthalene are naphthalene-related compounds. 1-Methylnaphthalene is a clear liquid and 2-methylnaphthalene is a solid; both can be smelled in air and in water at very low concentrations.

1-Methylnaphthalene and 2-methylnaphthalene are used to make other chemicals such as dyes and resins. 2-Methylnaphthalene is also used to make vitamin K.

What happens to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene when they enter the environment?

- ❏ Naphthalene enters the environment from industrial and domestic sources, and from accidental spills.
- ❏ Naphthalene can dissolve in water to a limited degree and may be present in drinking water from wells close to hazardous waste sites and landfills.
- ❏ Naphthalene can become weakly attached to soil or pass through soil into underground water.
- ❏ In air, moisture and sunlight break it down within 1 day. In water, bacteria break it down or it evaporates into the air.
- ❏ Naphthalene does not accumulate in the flesh of animals or fish that you might eat.
- ❏ 1-Methylnaphthalene and 2-methylnaphthalene are expected to act like naphthalene in air, water, or soil because they have similar chemical and physical properties.

How might I be exposed to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

- ❏ Breathing low levels in outdoor air.
- ❏ Breathing air contaminated from industrial discharges or smoke from burning wood, tobacco, or fossil fuels.
- ❏ Using or making moth repellents, coal tar products, dyes or inks could expose you to these chemicals in the air.
- ❏ Drinking water from contaminated wells.
- ❏ Touching fabrics that are treated with moth repellents containing naphthalene.
- ❏ Exposure to naphthalene, 1-methylnaphthalene and 2-methylnaphthalene from eating foods or drinking beverages is unlikely.

How can naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene affect my health?

Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. This could cause you to have too few red blood cells until your body replaces the destroyed cells. This condition is called hemolytic anemia. Some symptoms of hemolytic anemia are fatigue, lack of appetite, restlessness, and pale skin. Exposure to large amounts of naphthalene may also cause nausea, vomiting, diarrhea, blood in the urine, and a yellow color to the skin. Animals sometimes develop cloudiness in their eyes after swallowing high amounts of naphthalene. It is not clear whether this also develops in people. Rats and mice that breathed naphthalene vapors daily for a lifetime developed irritation and inflammation of their nose and lungs. It is unclear if naphthalene

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

causes reproductive effects in animals; most evidence says it does not.

There are no studies of humans exposed to 1-methylnaphthalene or 2-methylnaphthalene.

Mice fed food containing 1-methylnaphthalene and 2-methylnaphthalene for most of their lives had part of their lungs filled with an abnormal material.

How likely are naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene to cause cancer?

There is no direct evidence in humans that naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene cause cancer. However, cancer from naphthalene exposure has been seen in animal studies. Some female mice that breathed naphthalene vapors daily for a lifetime developed lung tumors. Some male and female rats exposed to naphthalene in a similar manner also developed nose tumors.

Based on the results from animal studies, the Department of Health and Humans Services (DHHS) concluded that naphthalene is reasonably anticipated to be a human carcinogen. The International Agency for Research on Cancer (IARC) concluded that naphthalene is possibly carcinogenic to humans. The EPA determined that naphthalene is a possible human carcinogen (Group C) and that the data are inadequate to assess the human carcinogenic potential of 2-methylnaphthalene.

How can naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene affect children?

Hospitals have reported many cases of hemolytic anemia in children, including newborns and infants, who either ate naphthalene mothballs or deodorants cakes or who were in close contact with clothing or blankets stored in naphthalene mothballs. Naphthalene can move from a pregnant woman's blood to the unborn baby's blood. Naphthalene has been detected in some samples of breast milk from the general U.S. population, but not at levels that are expected to be of concern.

There is no information on whether naphthalene has affected development in humans. No developmental abnormalities were observed in the offspring from rats, mice, and rabbits fed naphthalene during pregnancy.

We do not have any information on possible health effects of 1-methylnaphthalene or 2-methylnaphthalene on children.

How can families reduce the risks of exposure to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

❑ Families can reduce the risks of exposure to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene by avoiding smoking tobacco, generating smoke during cooking, or using fireplaces or heating appliances in the their homes.

❑ If families use naphthalene-containing moth repellents, the material should be enclosed in containers that prevent vapors from escaping, and kept out of the reach from children.

❑ Blankets and clothing stored with naphthalene moth repellents should be aired outdoors to remove naphthalene odors and washed before they are used.

❑ Families should inform themselves of the contents of air deodorizers that are used in their homes and refrain from using deodorizers with naphthalene.

Is there a medical test to determine whether I've been exposed to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

Tests are available that measure levels of these chemicals and their breakdown products in samples of urine, feces, blood, maternal milk, or body fat. These tests are not routinely available in a doctor's office because they require special equipment, but samples can be sent to special testing laboratories. These tests cannot determine exactly how much naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene you were exposed to or predict whether harmful effects will occur. If the samples are collected within a day or two of exposure, then the tests can show if you were exposed to a large or small amount of naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene.

Has the federal government made recommendations to protect human health?

The EPA recommends that children not drink water with over 0.5 parts per million (0.5 ppm) naphthalene for more than 10 days or over 0.4 ppm for any longer than 7 years. Adults should not drink water with more than 1 ppm for more than 7 years. For water consumed over a lifetime (70 years), the EPA suggests that it contain no more than 0.1 ppm naphthalene.

The Occupational Safety and Health Administration (OSHA) set a limit of 10 ppm for the level of naphthalene in workplace air during an 8-hour workday, 40-hour workweek. The National Institute for Occupational Safety and Health (NIOSH) considers more than 500 ppm of naphthalene in air to be immediately dangerous to life or health. This is the exposure level of a chemical that is likely to impair a worker's ability to leave a contaminate area and therefore, results in permanent health problems or death.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

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POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1996**

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl′ĭ-sī′klĭk ăr′ə-măt′ĭk hī′drə-kar′bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.

- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

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FUEL OILS

CAS # 8008-20-6, 70892-10-3, 68476-30-2, 68476-34-6, 68476-31-3

This fact sheet answers the most frequently asked health questions (FAQs) about fuel oils. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Fuel oils are liquid mixtures produced from petroleum, and their use mostly involves burning them as fuels. Drinking or breathing fuel oils may cause nausea or nervous system effects. However, exposure under normal use conditions is not likely to be harmful. Fuel oils have been found in at least 26 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are fuel oils?

(Pronounced fyo͞o′əl oilz)

Fuel oils are a variety of yellowish to light brown liquid mixtures that come from crude petroleum. Some chemicals found in fuel oils may evaporate easily, while others may more easily dissolve in water.

Fuel oils are produced by different petroleum refining processes, depending on their intended uses. Fuel oils may be used as fuel for engines, lamps, heaters, furnaces, and stoves, or as solvents.

Some commonly found fuel oils include kerosene, diesel fuel, jet fuel, range oil, and home heating oil. These fuel oils differ from one another by their hydrocarbon compositions, boiling point ranges, chemical additives, and uses.

What happens to fuel oils when they enter the environment?

- Some chemicals found in fuel oils may evaporate into the air from open containers or contaminated soil or water.
- Some chemicals found in fuel oils may dissolve in water after spills to surface waters or leaks from underground storage tanks.
- Some chemicals found in fuel oils may stick to particles in water, which will eventually cause them to settle to the bottom sediment.
- Some of the chemicals found in fuel oils may be broken down slowly in air, water, and soil by sunlight or small organisms.
- Some of the chemicals found in fuel oils may build up significantly in plants and animals.

How might I be exposed to fuel oils?

- Using a home kerosene heater or stove, or using fuel oils at work.
- Breathing air in home or building basements that has been contaminated with fuel oil vapors entering from the soil.
- Drinking or swimming in water that has been contaminated with fuel oils from a spill or a leaking underground storage tank.
- Touching soil contaminated with fuel oils.
- Using fuel oils to wash paint or grease from skin or equipment.

How can fuel oils affect my health?

Little information is available about the health effects that may be caused by fuel oils. People who use kerosene

stoves for cooking do not seem to have any health problems related to their exposure.

Breathing some fuel oils for short periods may cause nausea, eye irritation, increased blood pressure, headache, lightheadedness, loss of appetite, poor coordination, and difficulty concentrating. Breathing diesel fuel vapors for long periods may cause kidney damage and lower your blood's ability to clot.

Drinking small amounts of kerosene may cause vomiting, diarrhea, coughing, stomach swelling and cramps, drowsiness, restlessness, painful breathing, irritability, and unconsciousness. Drinking large amounts of kerosene may cause convulsions, coma, or death. Skin contact with kerosene for short periods may cause itchy, red, sore, or peeling skin.

How likely are fuel oils to cause cancer?

The International Agency for Research on Cancer (IARC) has determined that some fuel oils (heavy) may possibly cause cancer in humans, but for other fuel oils (light) there is not enough information to make a determination. IARC has also determined that occupational exposures to fuel oils during petroleum refining are probably carcinogenic in humans.

Some studies with mice have suggested that repeated contact with fuel oils may cause liver or skin cancer. However, other mouse studies have found this not to be the case. No studies are available in other animals or in people on the carcinogenic effects of fuel oils.

Is there a medical test to show whether I've been exposed to fuel oils?

There is no medical test that shows if you have been exposed to fuel oils. Tests are available to determine if some of the chemicals commonly found in fuel oils are in your blood. However, the presence of these chemicals in blood may not necessarily mean that you have been exposed to fuel oils.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) and the Air Force Office of Safety and Health (AFOSH) have set a permissible exposure level (PEL) of 400 parts of petroleum distillates per million parts of air (400 ppm) for an 8-hour workday, 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that average workplace air levels not exceed 350 milligrams of petroleum distillates per cubic meter of air (350 mg/m^3) for a 40-hour workweek.

The Department of Transportation (DOT) lists fuel oils as hazardous materials and, therefore, regulates their transportation.

Glossary

Carcinogenic: Able to cause cancer.

CAS: Chemical Abstracts Service.

Evaporate: To change into a vapor or a gas.

Hydrocarbon: Any compound made up of hydrogen and carbon.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Sediment: Mud and debris that have settled to the bottom of a body of water.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for fuel oils. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TRICHLOROETHYLENE

CAS # 79-01-6

Division of Toxicology ToxFAQs™ **July 2003**

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Trichloroethylene is a colorless liquid which is used as a solvent for cleaning metal parts. Drinking or breathing high levels of trichloroethylene may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Trichloroethylene has been found in at least 852 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is trichloroethylene?

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.

Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene dissolves a little in water, but it can remain in ground water for a long time.
- Trichloroethylene quickly evaporates from surface water, so it is commonly found as a vapor in the air.
- Trichloroethylene evaporates less easily from the soil than from surface water. It may stick to particles and remain for a long time.
- Trichloroethylene may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- Trichloroethylene does not build up significantly in plants and animals.

How might I be exposed to trichloroethylene?

- Breathing air in and around the home which has been contaminated with trichloroethylene vapors from shower water or household products such as spot removers and typewriter correction fluid.
- Drinking, swimming, or showering in water that has been contaminated with trichloroethylene.
- Contact with soil contaminated with trichloroethylene, such as near a hazardous waste site.
- Contact with the skin or breathing contaminated air while manufacturing trichloroethylene or using it at work to wash paint or grease from skin or equipment.

How can trichloroethylene affect my health?

Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating.

Breathing large amounts of trichloroethylene may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage.

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

Drinking large amounts of trichloroethylene may cause nausea, liver damage, unconsciousness, impaired heart function, or death.

Drinking small amounts of trichloroethylene for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear.

Skin contact with trichloroethylene for short periods may cause skin rashes.

How likely is trichloroethylene to cause cancer?

Some studies with mice and rats have suggested that high levels of trichloroethylene may cause liver, kidney, or lung cancer. Some studies of people exposed over long periods to high levels of trichloroethylene in drinking water or in workplace air have found evidence of increased cancer. Although, there are some concerns about the studies of people who were exposed to trichloroethylene, some of the effects found in people were similar to effects in animals.

In its 9th Report on Carcinogens, the National Toxicology Program (NTP) determined that trichloroethylene is "reasonably anticipated to be a human carcinogen." The International Agency for Research on Cancer (IARC) has determined that trichloroethylene is "probably carcinogenic to humans."

Is there a medical test to show whether I've been exposed to trichloroethylene?

If you have recently been exposed to trichloroethylene, it can be detected in your breath, blood, or urine. The breath test, if it is performed soon after exposure, can tell if you have been exposed to even a small amount of trichloroethylene.

Exposure to larger amounts is assessed by blood and urine tests, which can detect trichloroethylene and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products, so their detection is not absolute proof of exposure to trichloroethylene. This test isn't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level for trichloroethylene in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water.

The EPA has also developed regulations for the handling and disposal of trichloroethylene.

The Occupational Safety and Health Administration (OSHA) has set an exposure limit of 100 parts of trichloroethylene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: The ability of a substance to cause cancer.
CAS: Chemical Abstracts Service.
Evaporate: To change into a vapor or gas.
Milligram (mg): One thousandth of a gram.
Nonflammable: Will not burn.
ppm: Parts per million.
Sediment: Mud and debris that have settled to the bottom of a body of water.
Solvent: A chemical that dissolves other substances.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Trichloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Tetrachloroethylene - ToxFAQs™

CAS # 127-18-4

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing. Exposure to very high concentrations of tetrachloroethylene can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Tetrachloroethylene has been found in at least 771 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is tetrachloroethylene?

(Pronounced tĕt'rə-klôr' ō-ĕth'ə-lēn')

Tetrachloroethylene is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal-degreasing. It is also used to make other chemicals and is used in some consumer products.

Other names for tetrachloroethylene include perchloroethylene(PERC), PCE, and tetrachloroethene. It is a nonflammable liquid at room temperature. It evaporates easily into the air and has a sharp, sweet odor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part tetrachloroethylene per million parts of air (1 ppm) or more, although some can smell it at even lower levels.

What happens to tetrachloroethylene when it enters the environment?

- Much of the tetrachloroethylene that gets into water or soil evaporates into the air.
- Microorganisms can break down some of the tetrachloroethylene in soil or underground water.
- In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain.
- It does not appear to collect in fish or other animals that live in water.

How might I be exposed to tetrachloroethylene?

- When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- When you drink water containing tetrachloroethylene, you are exposed to it.

How can tetrachloroethylene affect my health?

High concentrations of tetrachloroethylene (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.

Irritation may result from repeated or extended skin contact with it. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used tetrachloroethylene to get a "high."

In industry, most workers are exposed to levels lower than those causing obvious nervous system effects. The health effects of breathing in air or drinking water with low levels of tetrachloroethylene are not known.

Results from some studies suggest that women who work in dry cleaning industries where exposures to tetrachloroethylene can be quite high may have more menstrual problems and spontaneous abortions than women who are not exposed. However, it is not known if tetrachloroethylene was responsible for these problems because other possible causes were not considered.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences

ATSDR

CS249955-AH

Tetrachloroethylene

CAS # 127-18-4

Results of animal studies, conducted with amounts much higher than those that most people are exposed to, show that tetrachloroethylene can cause liver and kidney damage. Exposure to very high levels of tetrachloroethylene can be toxic to the unborn pups of pregnant rats and mice. Changes in behavior were observed in the offspring of rats that breathed high levels of the chemical while they were pregnant.

How likely is tetrachloroethylene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that tetrachloroethylene may reasonably be anticipated to be a carcinogen. Tetrachloroethylene has been shown to cause liver tumors in mice and kidney tumors in male rats.

Is there a medical test to show whether I've been exposed to tetrachloroethylene?

One way of testing for tetrachloroethylene exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood.

Because it is stored in the body's fat and slowly released into the bloodstream, tetrachloroethylene can be detected in the breath for weeks following a heavy exposure.

Tetrachloroethylene and trichloroacetic acid (TCA), a breakdown product of tetrachloroethylene, can be detected in the blood. These tests are relatively simple to perform. These tests aren't available at most doctors' offices, but can be per formed at special laboratories that have the right equipment.

Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to tetrachloroethylene or the other chemicals.

Has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of tetrachloroethylene that can be in drinking water is 0.005 milligrams tetrachloroethylene per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) has set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that tetrachloroethylene be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

Glossary

Carcinogenicity: The ability of a substance to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

Nonflammable: Will not burn.

References

This ToxFAQs™ information is taken from the 1997 Toxicological Profile for Tetrachloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

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AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

1,2-DICHLOROETHENE
CAS # 540-59-0, 156-59-2, and 156-60-5

This fact sheet answers the most frequently asked health questions (FAQs) about 1,2-dichloroethene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to 1,2-dichloroethene occurs mainly in workplaces where it is made or used. Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired. *cis*-1,2-Dichloroethene has been found in at least 146 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA). *trans*-1,2-Dichloroethene was found in at least 563 NPL sites. 1,2-Dichloroethene was found at 336 sites, but the isomer (*cis*- or *trans*-) was not specified.

What is 1,2-dichloroethene?

(Pronounced 1,2-dī-klôr′ ō-ĕth′ēn)

1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]).

There are two forms of 1,2-dichloroethene; one is called *cis*-1,2-dichloroethene and the other is called *trans*-1,2-dichloroethene. Sometimes both forms are present as a mixture.

What happens to 1,2-dichloroethene when it enters the environment?

- 1,2-Dichloroethene evaporates rapidly into air.
- In the air, it takes about 5-12 days for half of it to break down.
- Most 1,2-dichloroethene in the soil surface or bodies of water will evaporate into air.
- 1,2-Dichloroethene can travel through soil or dissolve in water in the soil. It is possible that it can contaminate groundwater.
- In groundwater, it takes about 13-48 weeks to break down.
- There is a slight chance that 1,2-dichloroethene will break down into vinyl chloride, a different chemical which is believed to be more toxic than 1,2-dichloroethene.

How might I be exposed to 1,2-dichloroethene?

- Breathing 1,2-dichloroethene that has leaked from hazardous waste sites and landfills.
- Drinking contaminated tap water or breathing vapors from contaminated water while cooking, bathing, or washing dishes.
- Breathing 1,2-dichloroethene, touching it, or touching contaminated materials in the workplace.

How can 1,2-dichloroethene affect my health?

Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired; breathing very high levels can kill you.

When animals breathed high levels of *trans*-1,2-dichloroethene for short or longer periods of time, their livers and lungs were damaged and the effects were more severe with longer exposure times. Animals that breathed very high

levels of *trans*-1,2-dichloroethene had damaged hearts.

Animals that ingested extremely high doses of *cis*- or *trans*-1,2-dichloroethene died.

Lower doses of *cis*-1,2-dichloroethene caused effects on the blood, such as decreased numbers of red blood cells, and also effects on the liver.

The long-term (365 days or longer) human health effects after exposure to low concentrations of 1,2-dichloroethene aren't known. One animal study suggested that an exposed fetus may not grow as quickly as one that hasn't been exposed.

Exposure to 1,2-dichloroethene hasn't been shown to affect fertility in people or animals.

How likely is 1,2-dichloroethene to cause cancer?

The EPA has determined that *cis*-1,2-dichloroethene is not classifiable as to its human carcinogenicity.

No EPA cancer classification is available for *trans*-1,2-dichloroethene.

Is there a medical test to show whether I've been exposed to 1,2-dichloroethene?

Tests are available to measure concentrations of the breakdown products of 1,2-dichloroethene in blood, urine, and tissues. However, these tests aren't used routinely to determine whether a person has been exposed to this compound. This is because after you are exposed to 1,2-dichloroethene, the breakdown products in your body that are detected with these tests may be the same as those that come from exposure to other chemicals. These tests aren't available in most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum allowable level of *cis*-1,2-dichloroethene in drinking water at 0.07 milligrams per liter of water (0.07 mg/L) and *trans*-1,2-dichloroethene at 0.1 mg/L.

The EPA requires that any spills or accidental release of 1,000 pounds or more of 1,2-dichloroethene must be reported to the EPA.

The Occupational Health Safety and Health Administration (OSHA) has set the maximum allowable amount of 1,2-dichloroethene in workroom air during an 8-hour workday in a 40-hour workweek at 200 parts of 1,2-dichloroethene per million parts of air (200 ppm).

Glossary

Carcinogenicity: Ability of a substance to cause cancer.

CAS: Chemical Abstracts Service.

Fertility: Ability to reproduce.

Ingest: To eat or drink something.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Solvent: A chemical that can dissolve other substances.

References

This ToxFAQs information is taken from the 1996 Toxicological Profile for 1,2-Dichloroethene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

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NAPHTHALENE
CAS # 91-20-3

1-METHYLNAPHTHALENE
CAS # 90-12-0

2-METHYLNAPHTHALENE
CAS # 91-57-6

Division of Toxicology ToxFAQs™ **August 2005**

This fact sheet answers the most frequently asked health questions (FAQs) about naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because these substances may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene happens mostly from breathing air contaminated from the burning of wood, tobacco, or fossil fuels, industrial discharges, or moth repellents. Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. Naphthalene has caused cancer in animals. Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene have been found in at least 687, 36, and 412, respectively, of the 1,662 National Priority List sites identified by the Environmental Protection Agency (EPA).

What are naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

Naphthalene is a white solid that evaporates easily. Fuels such as petroleum and coal contain naphthalene. It is also called white tar, and tar camphor, and has been used in mothballs and moth flakes. Burning tobacco or wood produces naphthalene. It has a strong, but not unpleasant smell. The major commercial use of naphthalene is in the manufacture of polyvinyl chloride (PVC) plastics. Its major consumer use is in moth repellents and toilet deodorant blocks.

1-Methylnaphthalene and 2-methylnaphthalene are naphthalene-related compounds. 1-Methylnaphthalene is a clear liquid and 2-methylnaphthalene is a solid; both can be smelled in air and in water at very low concentrations.

1-Methylnaphthalene and 2-methylnaphthalene are used to make other chemicals such as dyes and resins. 2-Methylnaphthalene is also used to make vitamin K.

What happens to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene when they enter the environment?

- ❏ Naphthalene enters the environment from industrial and domestic sources, and from accidental spills.
- ❏ Naphthalene can dissolve in water to a limited degree and may be present in drinking water from wells close to hazardous waste sites and landfills.
- ❏ Naphthalene can become weakly attached to soil or pass through soil into underground water.
- ❏ In air, moisture and sunlight break it down within 1 day. In water, bacteria break it down or it evaporates into the air.
- ❏ Naphthalene does not accumulate in the flesh of animals or fish that you might eat.
- ❏ 1-Methylnaphthalene and 2-methylnaphthalene are expected to act like naphthalene in air, water, or soil because they have similar chemical and physical properties.

How might I be exposed to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

- ❏ Breathing low levels in outdoor air.
- ❏ Breathing air contaminated from industrial discharges or smoke from burning wood, tobacco, or fossil fuels.
- ❏ Using or making moth repellents, coal tar products, dyes or inks could expose you to these chemicals in the air.
- ❏ Drinking water from contaminated wells.
- ❏ Touching fabrics that are treated with moth repellents containing naphthalene.
- ❏ Exposure to naphthalene, 1-methylnaphthalene and 2-methylnaphthalene from eating foods or drinking beverages is unlikely.

How can naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene affect my health?

Exposure to large amounts of naphthalene may damage or destroy some of your red blood cells. This could cause you to have too few red blood cells until your body replaces the destroyed cells. This condition is called hemolytic anemia. Some symptoms of hemolytic anemia are fatigue, lack of appetite, restlessness, and pale skin. Exposure to large amounts of naphthalene may also cause nausea, vomiting, diarrhea, blood in the urine, and a yellow color to the skin. Animals sometimes develop cloudiness in their eyes after swallowing high amounts of naphthalene. It is not clear whether this also develops in people. Rats and mice that breathed naphthalene vapors daily for a lifetime developed irritation and inflammation of their nose and lungs. It is unclear if naphthalene

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

causes reproductive effects in animals; most evidence says it does not.

There are no studies of humans exposed to 1-methylnaphthalene or 2-methylnaphthalene.

Mice fed food containing 1-methylnaphthalene and 2-methylnaphthalene for most of their lives had part of their lungs filled with an abnormal material.

How likely are naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene to cause cancer?

There is no direct evidence in humans that naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene cause cancer. However, cancer from naphthalene exposure has been seen in animal studies. Some female mice that breathed naphthalene vapors daily for a lifetime developed lung tumors. Some male and female rats exposed to naphthalene in a similar manner also developed nose tumors.

Based on the results from animal studies, the Department of Health and Humans Services (DHHS) concluded that naphthalene is reasonably anticipated to be a human carcinogen. The International Agency for Research on Cancer (IARC) concluded that naphthalene is possibly carcinogenic to humans. The EPA determined that naphthalene is a possible human carcinogen (Group C) and that the data are inadequate to assess the human carcinogenic potential of 2-methylnaphthalene.

How can naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene affect children?

Hospitals have reported many cases of hemolytic anemia in children, including newborns and infants, who either ate naphthalene mothballs or deodorants cakes or who were in close contact with clothing or blankets stored in naphthalene mothballs. Naphthalene can move from a pregnant woman's blood to the unborn baby's blood. Naphthalene has been detected in some samples of breast milk from the general U.S. population, but not at levels that are expected to be of concern.

There is no information on whether naphthalene has affected development in humans. No developmental abnormalities were observed in the offspring from rats, mice, and rabbits fed naphthalene during pregnancy.

We do not have any information on possible health effects of 1-methylnaphthalene or 2-methylnaphthalene on children.

How can families reduce the risks of exposure to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

❑ Families can reduce the risks of exposure to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene by avoiding smoking tobacco, generating smoke during cooking, or using fireplaces or heating appliances in the their homes.

❑ If families use naphthalene-containing moth repellents, the material should be enclosed in containers that prevent vapors from escaping, and kept out of the reach from children.

❑ Blankets and clothing stored with naphthalene moth repellents should be aired outdoors to remove naphthalene odors and washed before they are used.

❑ Families should inform themselves of the contents of air deodorizers that are used in their homes and refrain from using deodorizers with naphthalene.

Is there a medical test to determine whether I've been exposed to naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene?

Tests are available that measure levels of these chemicals and their breakdown products in samples of urine, feces, blood, maternal milk, or body fat. These tests are not routinely available in a doctor's office because they require special equipment, but samples can be sent to special testing laboratories. These tests cannot determine exactly how much naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene you were exposed to or predict whether harmful effects will occur. If the samples are collected within a day or two of exposure, then the tests can show if you were exposed to a large or small amount of naphthalene, 1-methylnaphthalene, or 2-methylnaphthalene.

Has the federal government made recommendations to protect human health?

The EPA recommends that children not drink water with over 0.5 parts per million (0.5 ppm) naphthalene for more than 10 days or over 0.4 ppm for any longer than 7 years. Adults should not drink water with more than 1 ppm for more than 7 years. For water consumed over a lifetime (70 years), the EPA suggests that it contain no more than 0.1 ppm naphthalene.

The Occupational Safety and Health Administration (OSHA) set a limit of 10 ppm for the level of naphthalene in workplace air during an 8-hour workday, 40-hour workweek. The National Institute for Occupational Safety and Health (NIOSH) considers more than 500 ppm of naphthalene in air to be immediately dangerous to life or health. This is the exposure level of a chemical that is likely to impair a worker's ability to leave a contaminate area and therefore, results in permanent health problems or death.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Naphthalene, 1-Methylnaphthalene, and 2-Methylnaphthalene (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1996**

This fact sheet answers the most frequently asked health questions (FAQs) about polycyclic aromatic hydrocarbons (PAHs). For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

SUMMARY: Exposure to polycyclic aromatic hydrocarbons usually occurs by breathing air contaminated by wild fires or coal tar, or by eating foods that have been grilled. PAHs have been found in at least 600 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What are polycyclic aromatic hydrocarbons?

(Pronounced pŏl′ĭ-sī′klĭk ăr′ə-măt′ĭk hī′drə-kar′bənz)

Polycyclic aromatic hydrocarbons (PAHs) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Some PAHs are manufactured. These pure PAHs usually exist as colorless, white, or pale yellow-green solids. PAHs are found in coal tar, crude oil, creosote, and roofing tar, but a few are used in medicines or to make dyes, plastics, and pesticides.

What happens to PAHs when they enter the environment?

- PAHs enter the air mostly as releases from volcanoes, forest fires, burning coal, and automobile exhaust.
- PAHs can occur in air attached to dust particles.
- Some PAH particles can readily evaporate into the air from soil or surface waters.
- PAHs can break down by reacting with sunlight and other chemicals in the air, over a period of days to weeks.
- PAHs enter water through discharges from industrial and wastewater treatment plants.
- Most PAHs do not dissolve easily in water. They stick to solid particles and settle to the bottoms of lakes or rivers.
- Microorganisms can break down PAHs in soil or water after a period of weeks to months.
- In soils, PAHs are most likely to stick tightly to particles; certain PAHs move through soil to contaminate underground water.
- PAH contents of plants and animals may be much higher than PAH contents of soil or water in which they live.

How might I be exposed to PAHs?

- Breathing air containing PAHs in the workplace of coking, coal-tar, and asphalt production plants; smokehouses; and municipal trash incineration facilities.
- Breathing air containing PAHs from cigarette smoke, wood smoke, vehicle exhausts, asphalt roads, or agricultural burn smoke.
- Coming in contact with air, water, or soil near hazardous waste sites.
- Eating grilled or charred meats; contaminated cereals, flour, bread, vegetables, fruits, meats; and processed or pickled foods.
- Drinking contaminated water or cow's milk.

- Nursing infants of mothers living near hazardous waste sites may be exposed to PAHs through their mother's milk.

How can PAHs affect my health?

Mice that were fed high levels of one PAH during pregnancy had difficulty reproducing and so did their offspring. These offspring also had higher rates of birth defects and lower body weights. It is not known whether these effects occur in people.

Animal studies have also shown that PAHs can cause harmful effects on the skin, body fluids, and ability to fight disease after both short- and long-term exposure. But these effects have not been seen in people.

How likely are PAHs to cause cancer?

The Department of Health and Human Services (DHHS) has determined that some PAHs may reasonably be expected to be carcinogens.

Some people who have breathed or touched mixtures of PAHs and other chemicals for long periods of time have developed cancer. Some PAHs have caused cancer in laboratory animals when they breathed air containing them (lung cancer), ingested them in food (stomach cancer), or had them applied to their skin (skin cancer).

Is there a medical test to show whether I've been exposed to PAHs?

In the body, PAHs are changed into chemicals that can attach to substances within the body. There are special tests that can detect PAHs attached to these substances in body tissues or blood. However, these tests cannot tell whether any health effects will occur or find out the extent or source of your exposure to the PAHs. The tests aren't usually available in your doctor's office because special equipment is needed to conduct them.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 0.2 milligrams of PAHs per cubic meter of air (0.2 mg/m^3). The OSHA Permissible Exposure Limit (PEL) for mineral oil mist that contains PAHs is 5 mg/m^3 averaged over an 8-hour exposure period.

The National Institute for Occupational Safety and Health (NIOSH) recommends that the average workplace air levels for coal tar products not exceed 0.1 mg/m^3 for a 10-hour workday, within a 40-hour workweek. There are other limits for workplace exposure for things that contain PAHs, such as coal, coal tar, and mineral oil.

Glossary

Carcinogen: A substance that can cause cancer.

Ingest: Take food or drink into your body.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1995. Toxicological profile for polycyclic aromatic hydrocarbons. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop E-29, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 404-498-0093. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Tetrachloroethylene - ToxFAQs™

CAS # 127-18-4

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing. Exposure to very high concentrations of tetrachloroethylene can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Tetrachloroethylene has been found in at least 771 of the 1,430 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

What is tetrachloroethylene?

(Pronounced tĕt'rə-klôr' ō-ĕth'ə-lēn')

Tetrachloroethylene is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal-degreasing. It is also used to make other chemicals and is used in some consumer products.

Other names for tetrachloroethylene include perchloroethylene(PERC), PCE, and tetrachloroethene. It is a nonflammable liquid at room temperature. It evaporates easily into the air and has a sharp, sweet odor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part tetrachloroethylene per million parts of air (1 ppm) or more, although some can smell it at even lower levels.

What happens to tetrachloroethylene when it enters the environment?

- Much of the tetrachloroethylene that gets into water or soil evaporates into the air.
- Microorganisms can break down some of the tetrachloroethylene in soil or underground water.
- In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain.
- It does not appear to collect in fish or other animals that live in water.

How might I be exposed to tetrachloroethylene?

- When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- When you drink water containing tetrachloroethylene, you are exposed to it.

How can tetrachloroethylene affect my health?

High concentrations of tetrachloroethylene (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.

Irritation may result from repeated or extended skin contact with it. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used tetrachloroethylene to get a "high."

In industry, most workers are exposed to levels lower than those causing obvious nervous system effects. The health effects of breathing in air or drinking water with low levels of tetrachloroethylene are not known.

Results from some studies suggest that women who work in dry cleaning industries where exposures to tetrachloroethylene can be quite high may have more menstrual problems and spontaneous abortions than women who are not exposed. However, it is not known if tetrachloroethylene was responsible for these problems because other possible causes were not considered.

Agency for Toxic Substances and Disease Registry
Division of Toxicology and Human Health Sciences

ATSDR

CS249955-AH

Tetrachloroethylene

CAS # 127-18-4

Results of animal studies, conducted with amounts much higher than those that most people are exposed to, show that tetrachloroethylene can cause liver and kidney damage. Exposure to very high levels of tetrachloroethylene can be toxic to the unborn pups of pregnant rats and mice. Changes in behavior were observed in the offspring of rats that breathed high levels of the chemical while they were pregnant.

How likely is tetrachloroethylene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that tetrachloroethylene may reasonably be anticipated to be a carcinogen. Tetrachloroethylene has been shown to cause liver tumors in mice and kidney tumors in male rats.

Is there a medical test to show whether I've been exposed to tetrachloroethylene?

One way of testing for tetrachloroethylene exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood.

Because it is stored in the body's fat and slowly released into the bloodstream, tetrachloroethylene can be detected in the breath for weeks following a heavy exposure.

Tetrachloroethylene and trichloroacetic acid (TCA), a breakdown product of tetrachloroethylene, can be detected in the blood. These tests are relatively simple to perform. These tests aren't available at most doctors' offices, but can be per formed at special laboratories that have the right equipment.

Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to tetrachloroethylene or the other chemicals.

Has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of tetrachloroethylene that can be in drinking water is 0.005 milligrams tetrachloroethylene per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) has set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that tetrachloroethylene be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

Glossary

Carcinogenicity: The ability of a substance to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

Nonflammable: Will not burn.

References

This ToxFAQs™ information is taken from the 1997 Toxicological Profile for Tetrachloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30333.

Phone: 1-800-232-4636.

ToxFAQs™ Internet address via WWW is http://www.atsdr.cdc.gov/toxfaqs/index.asp.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

1,2-DICHLOROETHENE
CAS # 540-59-0, 156-59-2, and 156-60-5

This fact sheet answers the most frequently asked health questions (FAQs) about 1,2-dichloroethene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to 1,2-dichloroethene occurs mainly in workplaces where it is made or used. Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired. *cis*-1,2-Dichloroethene has been found in at least 146 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA). *trans*-1,2-Dichloroethene was found in at least 563 NPL sites. 1,2-Dichloroethene was found at 336 sites, but the isomer (*cis*- or *trans*-) was not specified.

What is 1,2-dichloroethene?

(Pronounced 1,2-dī-klôr′ ō-ĕth′ēn)

1,2-Dichloroethene, also called 1,2-dichloroethylene, is a highly flammable, colorless liquid with a sharp, harsh odor. It is used to produce solvents and in chemical mixtures. You can smell very small amounts of 1,2-dichloroethene in air (about 17 parts of 1,2-dichloroethene per million parts of air [17 ppm]).

There are two forms of 1,2-dichloroethene; one is called *cis*-1,2-dichloroethene and the other is called *trans*-1,2-dichloroethene. Sometimes both forms are present as a mixture.

What happens to 1,2-dichloroethene when it enters the environment?

- 1,2-Dichloroethene evaporates rapidly into air.
- In the air, it takes about 5-12 days for half of it to break down.
- Most 1,2-dichloroethene in the soil surface or bodies of water will evaporate into air.
- 1,2-Dichloroethene can travel through soil or dissolve in water in the soil. It is possible that it can contaminate groundwater.
- In groundwater, it takes about 13-48 weeks to break down.
- There is a slight chance that 1,2-dichloroethene will break down into vinyl chloride, a different chemical which is believed to be more toxic than 1,2-dichloroethene.

How might I be exposed to 1,2-dichloroethene?

- Breathing 1,2-dichloroethene that has leaked from hazardous waste sites and landfills.
- Drinking contaminated tap water or breathing vapors from contaminated water while cooking, bathing, or washing dishes.
- Breathing 1,2-dichloroethene, touching it, or touching contaminated materials in the workplace.

How can 1,2-dichloroethene affect my health?

Breathing high levels of 1,2-dichloroethene can make you feel nauseous, drowsy, and tired; breathing very high levels can kill you.

When animals breathed high levels of *trans*-1,2-dichloroethene for short or longer periods of time, their livers and lungs were damaged and the effects were more severe with longer exposure times. Animals that breathed very high

levels of *trans*-1,2-dichloroethene had damaged hearts.

Animals that ingested extremely high doses of *cis*- or *trans*-1,2-dichloroethene died.

Lower doses of *cis*-1,2-dichloroethene caused effects on the blood, such as decreased numbers of red blood cells, and also effects on the liver.

The long-term (365 days or longer) human health effects after exposure to low concentrations of 1,2-dichloroethene aren't known. One animal study suggested that an exposed fetus may not grow as quickly as one that hasn't been exposed.

Exposure to 1,2-dichloroethene hasn't been shown to affect fertility in people or animals.

How likely is 1,2-dichloroethene to cause cancer?

The EPA has determined that *cis*-1,2-dichloroethene is not classifiable as to its human carcinogenicity.

No EPA cancer classification is available for *trans*-1,2-dichloroethene.

Is there a medical test to show whether I've been exposed to 1,2-dichloroethene?

Tests are available to measure concentrations of the breakdown products of 1,2-dichloroethene in blood, urine, and tissues. However, these tests aren't used routinely to determine whether a person has been exposed to this compound. This is because after you are exposed to 1,2-dichloroethene, the breakdown products in your body that are detected with these tests may be the same as those that come from exposure to other chemicals. These tests aren't available in most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set the maximum allowable level of *cis*-1,2-dichloroethene in drinking water at 0.07 milligrams per liter of water (0.07 mg/L) and *trans*-1,2-dichloroethene at 0.1 mg/L.

The EPA requires that any spills or accidental release of 1,000 pounds or more of 1,2-dichloroethene must be reported to the EPA.

The Occupational Health Safety and Health Administration (OSHA) has set the maximum allowable amount of 1,2-dichloroethene in workroom air during an 8-hour workday in a 40-hour workweek at 200 parts of 1,2-dichloroethene per million parts of air (200 ppm).

Glossary

Carcinogenicity: Ability of a substance to cause cancer.

CAS: Chemical Abstracts Service.

Fertility: Ability to reproduce.

Ingest: To eat or drink something.

Milligram (mg): One thousandth of a gram.

ppm: Parts per million.

Solvent: A chemical that can dissolve other substances.

References

This ToxFAQs information is taken from the 1996 Toxicological Profile for 1,2-Dichloroethene produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TRICHLOROETHYLENE

CAS # 79-01-6

Division of Toxicology ToxFAQs™ **July 2003**

This fact sheet answers the most frequently asked health questions (FAQs) about trichloroethylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Trichloroethylene is a colorless liquid which is used as a solvent for cleaning metal parts. Drinking or breathing high levels of trichloroethylene may cause nervous system effects, liver and lung damage, abnormal heartbeat, coma, and possibly death. Trichloroethylene has been found in at least 852 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is trichloroethylene?

Trichloroethylene (TCE) is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste. It is used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers.

Trichloroethylene is not thought to occur naturally in the environment. However, it has been found in underground water sources and many surface waters as a result of the manufacture, use, and disposal of the chemical.

What happens to trichloroethylene when it enters the environment?

- Trichloroethylene dissolves a little in water, but it can remain in ground water for a long time.
- Trichloroethylene quickly evaporates from surface water, so it is commonly found as a vapor in the air.
- Trichloroethylene evaporates less easily from the soil than from surface water. It may stick to particles and remain for a long time.
- Trichloroethylene may stick to particles in water, which will cause it to eventually settle to the bottom sediment.
- Trichloroethylene does not build up significantly in plants and animals.

How might I be exposed to trichloroethylene?

- Breathing air in and around the home which has been contaminated with trichloroethylene vapors from shower water or household products such as spot removers and typewriter correction fluid.
- Drinking, swimming, or showering in water that has been contaminated with trichloroethylene.
- Contact with soil contaminated with trichloroethylene, such as near a hazardous waste site.
- Contact with the skin or breathing contaminated air while manufacturing trichloroethylene or using it at work to wash paint or grease from skin or equipment.

How can trichloroethylene affect my health?

Breathing small amounts may cause headaches, lung irritation, dizziness, poor coordination, and difficulty concentrating.

Breathing large amounts of trichloroethylene may cause impaired heart function, unconsciousness, and death. Breathing it for long periods may cause nerve, kidney, and liver damage.

ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html

Drinking large amounts of trichloroethylene may cause nausea, liver damage, unconsciousness, impaired heart function, or death.

Drinking small amounts of trichloroethylene for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women, although the extent of some of these effects is not yet clear.

Skin contact with trichloroethylene for short periods may cause skin rashes.

How likely is trichloroethylene to cause cancer?

Some studies with mice and rats have suggested that high levels of trichloroethylene may cause liver, kidney, or lung cancer. Some studies of people exposed over long periods to high levels of trichloroethylene in drinking water or in workplace air have found evidence of increased cancer. Although, there are some concerns about the studies of people who were exposed to trichloroethylene, some of the effects found in people were similar to effects in animals.

In its 9th Report on Carcinogens, the National Toxicology Program (NTP) determined that trichloroethylene is "reasonably anticipated to be a human carcinogen." The International Agency for Research on Cancer (IARC) has determined that trichloroethylene is "probably carcinogenic to humans."

Is there a medical test to show whether I've been exposed to trichloroethylene?

If you have recently been exposed to trichloroethylene, it can be detected in your breath, blood, or urine. The breath test, if it is performed soon after exposure, can tell if you have been exposed to even a small amount of trichloroethylene.

Exposure to larger amounts is assessed by blood and urine tests, which can detect trichloroethylene and many of its breakdown products for up to a week after exposure. However, exposure to other similar chemicals can produce the same breakdown products, so their detection is not absolute proof of exposure to trichloroethylene. This test isn't available at most doctors' offices, but can be done at special laboratories that have the right equipment.

Has the federal government made recommendations to protect human health?

The EPA has set a maximum contaminant level for trichloroethylene in drinking water at 0.005 milligrams per liter (0.005 mg/L) or 5 parts of TCE per billion parts water.

The EPA has also developed regulations for the handling and disposal of trichloroethylene.

The Occupational Safety and Health Administration (OSHA) has set an exposure limit of 100 parts of trichloroethylene per million parts of air (100 ppm) for an 8-hour workday, 40-hour workweek.

Glossary

Carcinogenicity: The ability of a substance to cause cancer.
CAS: Chemical Abstracts Service.
Evaporate: To change into a vapor or gas.
Milligram (mg): One thousandth of a gram.
Nonflammable: Will not burn.
ppm: Parts per million.
Sediment: Mud and debris that have settled to the bottom of a body of water.
Solvent: A chemical that dissolves other substances.

References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Trichloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is http://www.atsdr.cdc.gov/toxfaq.html . ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

APPENDIX B
REPORT FORMS

WEEKLY SAFETY REPORT FORM

Week Ending: _____ Project Name/Number: _____

Report Date: _____ Project Manager Name: _____

Summary of any violations of procedures occurring that week:

_____

_____

_____

Summary of any job related injuries, illnesses, or near misses that week:

_____

_____

_____

_____

Summary of air monitoring data that week (include and sample analyses, action levels exceeded, and actions taken):

_____

_____

_____

Comments:

_____

_____

_____

Name: _____ Company: _____

Signature: _____ Title: _____

INCIDENT REPORT FORM

Date of Report: _____

Injured: _____

Employer: _____

Site: _____ Site Location: _____

Report Prepared By: _____ _____
Signature Title

ACCIDENT/INCIDENT CATEGORY (check all that applies)

___Injury	___ Illness	___ Near Miss
__ Property Damage	___ Fire	___ Chemical Exposure
__ On-site Equipment	___ Motor Vehicle	___ Electrical
__ Mechanical	___ Spill	___ Other

DATE AND TIME OF ACCIDENT/INCIDENT: Narrative report of Accident/Incident: Identify: 1) actions leading to or contributing to the accident/incident; 2) the accident/incident occurrence; and 3) actions following the accident/incident.

_____

_____

_____

_____

_____

_____

_____

_____

_____

WITNESS TO ACCIDENT/INCIDENT:

Name:	_____	Company:	_____
Address:	_____	Address:	_____
Phone No.:	_____	Phone No.:	_____
Name:	_____	Company:	_____
Address:	_____	Address:	_____
Phone No.:	_____	Phone No.:	_____

INJURED - ILL:

Name: _____ SSN: _____

Address: _____ Age: _____

Length of Service: _____ Time on Present Job: _____

Time/Classification: _____

SEVERITY OF INJURY OR ILLNESS:

____ Disabling ___ Non-disabling ___ Fatality

____ Medical Treatment ___ First Aid Only

ESTIMATED NUMBER OF DAYS AWAY FROM JOB: _____

NATURE OF INJURY OR ILLNESS: _____

_____

_____

_____

CLASSIFICATION OF INJURY:

__ Abrasions _____ Dislocations ____ Punctures

__ Bites _____ Faint/Dizziness ____ Radiation Burns

__ Blisters _____ Fractures ____ Respiratory Allergy

__ Bruises _____ Frostbite ____ Sprains

__ Chemical Burns _____ Heat Burns ____ Toxic Resp. Exposure

__ Cold Exposure _____ Heat Exhaustion ____ Toxic Ingestion

__ Concussion _____ Heat Stroke ____ Dermal Allergy

__ Lacerations

Part of Body Affected: _____

Degree of Disability: _____

Date Medical Care was Received: _____

Where Medical Care was Received: _____

Address (if off-site): _____

(If two or more injuries, record on separate sheets)

PROPERTY DAMAGE:

Description of Damage: _____

_____

Cost of Damage: $ _____

ACCIDENT/INCIDENT LOCATION: _____

ACCIDENT/INCIDENT ANALYSIS: Causative agent most directly related to accident/incident (Object, substance, material, machinery, equipment, conditions)

_____

_____

_____

_____

Was weather a factor?:_____

_____

Unsafe mechanical/physical/environmental condition at time of accident/incident (Be specific):

_____

_____

_____

Personal factors (Attitude, knowledge or skill, reaction time, fatigue):

_____

_____

ON-SITE ACCIDENTS/INCIDENTS:

Level of personal protection equipment required in Site Safety Plan:

_____

_____

Modifications:

_____

Was injured using required equipment?:

_____

_____

If not, how did actual equipment use differ from plan?:

_____

_____

ACTION TAKEN TO PREVENT RECURRENCE: (Be specific. What has or will be done? When will it be done? Who is the responsible party to insure that the correction is made?

ACCIDENT/INCIDENT REPORT REVIEWED BY:

SSO Name Printed SSO Signature

OTHERS PARTICIPATING IN INVESTIGATION:

Signature Title

Signature Title

Signature Title

ACCIDENT/INCIDENT FOLLOW-UP: Date:

Outcome of accident/incident:

Physician's recommendations:

Date injured returned to work:
Follow-up performed by:

Signature Title

ATTACH ANY ADDITIONAL INFORMATION TO THIS FORM

APPENDIX C
EMERGENCY HAND SIGNALS

EMERGENCY SIGNALS

In most cases, field personnel will carry portable radios for communication. If this is the case, a transmission that indicates an emergency will take priority over all other transmissions. All other site radios will yield the frequency to the emergency transmissions.

Where radio communications is not available, the following air-horn and/or hand signals will be used:

EMERGENCY HAND SIGNALS

OUT OF AIR, CAN'T BREATHE!	**Hand gripping throat**
LEAVE AREA IMMEDIATELY, NO DEBATE!	**(No Picture) Grip partner's wrist or place both hands around waist**
NEED ASSISTANCE!	 **Hands on top of head**
OKAY! – I'M ALL RIGHT! **- I UNDERSTAND!**	 **Thumbs up**
NO! - NEGATIVE!	 **Thumbs down**

APPENDIX E
QUALITY ASSURANCE PROJECT PLAN

34 BERRY STREET

BROOKLYN, NEW YORK

Quality Assurance Project Plan

AKRF Project Number: 11259
BCP Site Number: C224268

Prepared for:

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1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) describes the protocols and procedures that will be followed during implementation of the Site Management Plan (SMP) at the 34 Berry Street site (the Site), hereafter referred to as the Site. The legal definition of the Site is Brooklyn Borough Tax Block 2289, Lot 14. The Site is located on the western side of Berry Street, between North 11th and North 12th Streets, and is comprised of a seven-story residential building and courtyard area, with a basement level parking garage. A Site Location Plan is provided as Figure 1.

The objective of this QAPP is to provide for Quality Assurance (QA) and maintain Quality Control (QC) during sampling performed to evaluate the performance and effectiveness of the remedy (including treatments and Engineering Controls as described in the SMP) to reduce or mitigate contamination at the Site conducted under the New York State Department of Environmental Conservation (NYSDEC) oversight in the Brownfield Cleanup Program (BCP) (BCP Site No. C224268). Adherence to the QAPP will ensure that defensible data will be obtained to confirm the successful operation and maintenance of remedial systems.

2.0 PROJECT TEAM

The project team will be drawn from AKRF professional and technical personnel, and AKRF's subcontractors. All field personnel and subcontractors will have completed a 40-hour training course and updated 8-hour refresher course that meet the Occupational Safety and Health Administration (OSHA) requirements of 29 CFR Part 1910. The following sections describe the key project personnel and their responsibilities.

2.1 PROJECT DIRECTOR

The project director will be responsible for the general oversight of all aspects of the project, including scheduling, budgeting, data management, and field program decision-making. The project director will communicate regularly with all members of the AKRF project team and the NYSDEC to ensure a smooth flow of information between involved parties. Marc Godick will serve as the project director for the SMP. Mr. Godick's resume is included in Attachment A.

2.2 REMEDIAL ENGINEER

The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the SMP. The Remedial Engineer will certify in the Periodic Review Reports which summarize that the engineering controls were monitored, maintained, and remain effective. The Remedial Engineer will certify that the Site management activities were conducted by qualified environmental professionals under her supervision and that the remediation requirements set forth in the SMP and any other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. The Remedial Engineer for this project will be Rebecca Kinal, P.E. Ms. Kinal's resume is included in Attachment A.

2.3 QUALITY ASSURANCE/ QUALITY CONTROL (QA/QC) OFFICER

Mr. Marcus Simons will serve as the QA/QC officer and will be responsible for adherence to the QAPP. The QA/QC officer will review the procedures with all personnel prior to commencing any fieldwork and will conduct periodic Site visits to assess implementation of the procedures. The QA/QC officer will also be responsible for reviewing Data Usability Summary Reports (DUSRs) for the SMP. Mr. Simon's resume is included in Attachment A.

2.4 PROJECT MANAGER

The project manager will be responsible for directing and coordinating all elements of the SMP. The project manager will prepare reports and participate in meetings with the Site owner/Volunteer, and/or the NYSDEC. Bryan Zieroff will serve as the project manager for the SMP. Mr. Zieroff's resume is included in Attachment A.

2.5 PROJECT MANAGER ALTERNATE

The project manager alternate will be responsible for assisting the project manager. The project manager alternate will help prepare reports and will participate in meetings with the Site owner/Volunteer, and/or the NYSDEC. Mark Jepsen will serve as the project manager alternate for the SMP. Mr. Jepsen's resume is included in Attachment A.

2.6 FIELD TEAM LEADER, FIELD TECHNICIAN, AND SITE SAFETY OFFICER, AND ALTERNATES

The field team leader will be responsible for conducting routine operations maintenance and monitoring and health and safety activities in the field and will ensure adherence to the SMP and Health and Safety Plan (HASP), included in Appendix D of the SMP. The field team leader will also act as the field technician and Site safety officer (SSO), and will report to the project manager or project manager alternate on a regular basis regarding daily progress and any deviations from the work plan. The field team leader will be a qualified and responsible person able to act professionally and promptly during environmental work at the Site. Mr. Jepsen will also act at the field team leader. The field team leader alternate is Tom Giordano of AKRF. Resumes for Mr. Jepsen and Mr. Giordano are included in Attachment A.

2.7 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) OFFICER

The laboratory QA/QC officer will be responsible for quality control procedures and checks in the laboratory and ensuring adherence to laboratory protocols. The QA/QC officer will track the movement of samples from the time they are checked in at the laboratory to the time that analytical results are issued, and will conduct a final check on the analytical calculations and sign off on the laboratory reports. The laboratory QA/QC officer will be Carl Ambruster of Eurofins TestAmerica Laboratories (TestAmerica), the New York State Department of Health (NYSDOH) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory being employed for all environmental sampling at the Site. Mr. Ambruster's resume is included in Attachment A.

2.8 LABORATORY DATA VALIDATOR

The laboratory data validator will be responsible for third party data validation and preparation of Data Usability Summary Reports (DUSRs). The third-party laboratory data validator will be Lori Beyer of L.A.B. Validation Corp. Ms. Beyer's resume is included in Attachment A.

3.0 STANDARD OPERATING PROCEDURES (SOPS)

The following sections describe the SOPs for the monitoring activities included in the SMP. During these operations, safety monitoring will be performed as described in the HASP, included as Appendix D of the SMP. SMP implementation will include routine groundwater system inspection (conducted at least monthly) and quarterly groundwater monitoring and sampling. The SMP also includes provisions and appropriate actions to be taken in the event that future renovation or redevelopment of the Site requires the breaching of the composite cover system and excavation/removal of underlying soil.

3.1 EXCAVATION AND REMOVAL OF SOIL/FILL

Any planned disturbance to the composite cover system will comprise the following activities:

1. The location of existing sub-slab vapor monitoring points, groundwater monitoring wells, injection wells, extraction wells and engineering controls (ECs) located within or beneath the concrete floor slab including SSDS piping, the extraction and injection well network, and the groundwater treatment system will be identified using SMP Figures 14, 15, and 18.
2. The existing concrete floor will be marked out and saw cut, at a minimum, around the perimeter of the designated removal area.
3. Excavated fill material will be removed using an excavator or hand tools. Fill material excavated from beneath the concrete slab to a maximum depth of five feet below grade and that exhibits no evidence of contamination may be characterized for potential reuse as backfill material on-site or handled and disposed of as non-hazardous waste. Material excavated in other areas of the Site should be handled in accordance with the Excavation Work Plan included as Appendix C of the SMP.
4. All excavated material requiring staging for overnight or longer will follow the procedures in Section 3.1.1.
5. Vapor barrier/waterproofing membrane repairs will be performed, as necessary.

Damaged floors, walls, sub-slab venting system piping, groundwater treatment system piping, additional utilities, or other building elements outside the removal area, will be repaired prior to demobilization from the Site.

3.1.1 Stockpiling/Staging Area

Prior to excavation and removal of contaminated material, the stockpiling/staging area will be selected and prepared prior to the commencement of excavation activities to protect building occupants. Staging area(s) will be prepared for staging any contaminated material overnight or longer using the procedures described below:

The material staging area(s) will be prepared by placing 6-mil plastic on the ground and covered with additional 6-mil plastic sheeting. Sealable containers with tight-fitting covers may also be utilized for the staging of VOC-contaminated material overnight or longer, to prevent the migration of VOCs into the site building.

3.1.2 Backfill/Reuse Sampling

In addition to any proposed soil excavation, some shallow soil throughout the Site, such as the material removed as part of SSDS component or groundwater treatment system repairs may be excavated. Prior to reuse as backfill, the excavated soil will be evaluated using the criteria below:

1. Concrete or demolition debris that does not exhibit signs of contamination will be sampled for asbestos prior to reuse on-Site.
2. Material proposed for reuse will be sampled at a frequency and for the required parameters as outlined in NYSDEC's DER-10, Table 5.4.
3. Samples will be collected into laboratory-supplied containers.
4. Samples will be kept in an ice-filled cooler or refrigerator (not asbestos samples) until receipt by the laboratory.

5. Decontaminate all sampling equipment between sampling locations as described in Sections 3.3 of this QAPP.

3.2 WELL INSTALLATION AND DEVELOPMENT

Groundwater monitoring, injection, and recovery wells have been installed throughout the Site. Additional monitoring, injection, and/or recovery wells may be installed at the Site to replace or supplement the current network of wells. The following procedure should be followed in the event that a well requires replacement or redevelopment or additional wells are installed. The well locations and/or screen depths may be adjusted based on observations and data compiled during the necessary field activities. Details outlined below may be altered based on the preparation and submittal of a work plan submitted to NYSDEC and NYSDOH. This QAPP will be updated accordingly and included in the SMP.

All monitoring, recovery and/or injection wells will be advanced using a Geoprobe direct push technology or limited access hollow stem auger technology. A target depth of approximately 5 feet below the water table (10 to 12 feet below basement grade) will be used for injection and monitoring wells, and a target depth of up to 8 feet below the water table (13 to 15 feet below basement grade) will be used for the recovery wells. Injection wells will be constructed with 5 feet of PVC screen, whereas the recovery wells will be constructed with 10 feet of PVC screen. The first attempt for recovery wells will include 6.25-inch inside diameter augers to install a 4-inch PVC recovery well. If the target depth is not reachable using the larger diameter augers, a second attempt will include 4.25-inch inside diameter augers to install a 2-inch PVC well. The 4.25-inch inside diameter augers will be used to install 2-inch PVC injection wells.

Morie sand will be backfill around the screen zone of each new well to a depth of 2 feet above the screen. The annular space around the well riser will be sealed with bentonite extending one to two feet above the sand filter pack and completed with a non-shrinking cement mixture to approximately one foot below grade. Each injection/recovery well will be completed using flush to grade locking gate boxes. Due to the documented low yielding conditions, each well will be developed by agitating the well screen with a surge block and pumping out the sediment until clear, if practical. The location/elevation of each new PVC well will be surveyed by a licensed surveyor and incorporated into the existing site map.

3.3 DECONTAMINATION OF SAMPLING EQUIPMENT

All sampling equipment (augers, drilling rods, split spoon samplers, probe rods, pumps, etc.) will be either dedicated or decontaminated between sampling locations. Decontamination will be conducted on plastic sheeting (or equivalent) that is bermed to prevent discharge to the ground. The decontamination procedure will be as follows:

1. Scrub using tap water/Simple Green® mixture and bristle brush.
2. Rinse with tap water.
3. Scrub again with tap water/Simple Green® mixture and bristle brush.
4. Rinse with tap water.
5. Rinse with distilled water.
6. Air-dry the equipment, if possible.

3.4 MANAGEMENT OF INVESTIGATION DERIVED WASTE (IDW)

IDW, with the exception of purged groundwater, will be containerized in New York State Department of Transportation (NYSDOT)-approved 55-gallon drums during the site management activities. The drums will be sealed at the end of each work day and labeled with the date, the boring location(s), the type of waste e.g., drill cuttings, excavated trenching material), and the name and phone number of an AKRF point-of-contact. All IDW collected into drums will be sampled and disposed of or treated according to applicable local, state, and federal regulations. Purged groundwater will be poured into the on-site LNAPL groundwater treatment system.

4.0 SAMPLING AND LABORATORY PROCEDURES

4.1 MONITORING WELL SAMPLING

Groundwater samples for Site Management monitoring will be collected using low-flow sampling techniques, as described in U.S. EPA's Ground-Water Sampling Guidelines for Superfund and RCRA Project Managers [EPA 542-S-02-001, May 2002]. Sampling will be conducted according to the following procedure:

- Prepare the sampling area by placing plastic sheeting over the well. Cut a hole in the sheeting to provide access to the well cover.
- Slowly remove the locking cap and immediately measure the vapor concentrations in the well with a PID calibrated to the manufacturer's specifications.
- Measure the depth to water and total well depth, and check for the presence of NAPL using an oil/water interface probe. Measure the thickness of NAPL, if any, and record in field book and well log. Groundwater samples will not be collected from wells containing measurable NAPL.
- Use the water level and total well depth measurements to calculate the length of the mid-point of the water column within the screened interval. For example, for a well where the total depth is 20 feet, screened interval is 10 to 20 feet, and depth to water is 14 feet, the mid-point of the water column within the screened interval would be 17 feet.
- Connect dedicated tubing to either a submersible bladder pump or peristaltic pump, and lower the pump such that the intake of the pump is set at the mid-point of the water column within the screened interval of the well. Connect the discharge end of the tubing to the flow-through cell of a YSI multi-parameter (or equivalent) meter. Connect tubing to the output of the cell and place the discharge end of the tubing in a five-gallon bucket. Since each on-site NAPL recovery well requires purging with a peristaltic pump, and the existing 1-inch wells have a limited diameter for access, and a peristaltic pump has been used for all previous sampling events, AKRF recommends purging each well with a peristaltic for consistency. The peristaltic pump will allow for sample collection without the need for high density bladders when analyzing for emerging contaminants and minimize the potential for tainting the samples during collection.
- Activate the pump at the lowest flow rate setting of the pump.
- Measure the depth to water within the well. The pump flow rate may be increased such that the water level measurements do not change by more than 0.3 feet as compared to the initial static reading. The well-purging rate should be adjusted so as to produce a smooth, constant (laminar) flow rate and so as not to produce excessive turbulence in the well. The expected

targeted purge rate will be approximately 0.5 liters/minute and will be no greater than 3.8 liters/minute.

- Transfer discharged water from the 5-gallon buckets to on-site LNAPL remediation system.
- During purging, collect periodic samples and analyze for water quality indicators (e.g., turbidity, pH, temperature, dissolved oxygen (DO), reduction-oxidation potential (ORP), and specific conductivity) with measurements collected approximately every five minutes.
- Continue purging the well until turbidity is less than 50 nephelometric turbidity units (NTUs) and water quality indicators have stabilized to the extent practicable. The criteria for stabilization will be three successive readings for the following parameters and criteria:

Stabilization Criteria

Parameter	Stabilization Criteria
PH	+/- 0.1 pH units
Specific Conductance	+/- 3% mS/cm
ORP/Eh	+/- 10mV
Turbidity	<50 NTU
Dissolved Oxygen	+/- 0.3 mg/l

Notes: mS/cm = millisievert per centimeter
mV = millivolts
NTU = nephthalometric turbidity units
mg/l = milligrams per liter

- If the water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, purging may be discontinued. Efforts to stabilize the water quality for the well must be recorded in the field book, and samples may then be collected as described herein.
- After purging, disconnect the tubing to the inlet of the flow-through cell. Collect groundwater samples directly from the discharge end of the tubing and place into the required sample containers as described in Section 4.4 of this QAPP. Label the containers as described in Section 4.4.1.1, Table 2 of this QAPP and place in a chilled cooler.
- Once sampling is complete, remove the pump and tubing from the well. Dispose of the sampling materials and PPE in a designated 55-gallon drum. The purge water will be managed as described in Section 3.4 of this QAPP.
- Decontaminate the pump (where necessary), oil/water interface probe, and flow-through cell, as described in Section 3.3 of this QAPP.
- Record all measurements (depth to water, depth to NAPL, water quality parameters, turbidity), calculations (well volume) and observations in the project logbook and field data sheet, if applicable.

A figure illustrating the SMP groundwater sampling locations is included in the Monitoring Locations for Site Management on Figure 18 of the SMP.

4.2 CONTINGENCY SOIL GAS SAMPLING

In the event of a triggering event necessitating soil gas sampling, as described in Section 4.4 of the SMP, it will be conducted using Summa canisters with 8-hour flow regulators. Soil gas samples will be collected using the following procedures:

4.2.1 Sample Set-up

1. Install flexible hose to a peristaltic pump and connect the Teflon sample tubing to the hose. Connect the other end (discharge end) of the flexible tubing to a 1-liter Tedlar bag. Purge the soil gas sampler of approximately three sampler volumes (0.4 liters) by activating the pump to fill the Tedlar bag to near capacity. The air withdrawal flow rate shall be 0.2 liters/minute or less.
2. The Tedlar bag will be analyzed in the field using a PID calibrated to the manufacturer's specifications to check for levels of VOCs in the sub-slab soil vapor.
3. Disconnect the sample tubing from the peristaltic pump and connect it to the inlet of a labeled 6-liter Summa canister.
4. Repeat procedure for all sampling locations.

4.2.2 Sample Collection

5. After Summa canisters are set up at all of the sampling locations, record the vacuum reading from the vacuum gauge on the canister at the beginning of the 8-hour sampling period. Open the valve of the canister and record the time in the field book.
6. At the end of the 8-hour sampling period, close the valve, remove the flow-rate controllers and vacuum gauges, install caps on canisters, and record the time at the end of the sampling period.
7. Place canisters in shipping containers for transportation to laboratory.
8. Repeat procedure for all sampling locations.

4.3 CONTINGENCY INDOOR AIR SAMPLING

If a triggering event occurs at the Site as described in Section 4.4 of the SMP, contingency indoor air sampling will be performed in accordance with the NYSDOH Vapor Intrusion Guidance Document to determine potential vapor intrusion impacts within the building on-site. If required, indoor air quality sampling will be performed at the Site in accordance with the following details:

- The indoor air sampling is to be conducted following the completion of a pre-sampling inspection and chemical inventory of the Site building.
- Place a labeled 6-liter Summa canister at the breathing zone level (3 to 4 feet above ground surface) in the approximate area of the four sub-slab soil vapor sampling locations established as part of the Remedial Action in March 2021 throughout the basement floor of the Site building.
- Record the vacuum reading from the vacuum gauge on the canister at the beginning of the 8-hour sampling period.
- Open the valve of the canister and record the time in the field book. At the end of the 8-hour sampling period, close valve, remove flow-rate controllers and vacuum gauges, install caps on canisters, and record time.
- Place canisters in shipping containers for transportation to laboratory.
- Repeat procedure for all of the sampling locations.

4.4 LABORATORY METHODS

Table 1 summarizes the laboratory methods that will be used to analyze field samples and the sample container type, preservation, and applicable holding times. TestAmerica of Edison, New Jersey, a NYSDOH ELAP-certified laboratory subcontracted to AKRF, will be used for all chemical analyses in accordance with the Division of Environmental Remediation (DER)-10 2.1(b) and 2.1(f) with Category B Deliverables.

Table 1
Laboratory Analytical Methods

Matrix	Analysis	EPA Method	Bottle Type	Preservative	Hold Time
Soil (Reuse/Backfill)	TCL VOCs,	8260C	EnCore sampler	4ºC	48 hours
	SVOCs,	8270D	Min. 4 oz. clear glass jar	4ºC	5 days to extract, 49 days for analysis
	TAL Metals Mercury	6010C 7471B	Min. 4 oz. clear glass jar	4ºC	14 days 26 days
	PCBs	8082A	Min.4 oz. clear glass jar	4ºC	14 days
	Pesticides	8081B	Min.4 oz. clear glass jar	4ºC	5 days to extract, 49 days for analysis
Groundwater	VOCs	8260C	3 40 mL Glass Vials	HCl to pH < 2 and ≤ 6 ºC	14 days to analyze
	CP-51 SVOCs	CP-51 List in 8270D	2 1,000 mL Amber Jars	≤ 6 ºC	7 days to extract; 40 days to analyze
Sub Slab Soil Vapor	VOCs	TO-15	6L Summa Canisters (8-hr flow controllers)	None	30 days
Indoor Air	VOCs	TO-15	6L Summa Canisters (8-hr flow controllers)	None	30 days

Notes:
EPA - Environmental Protection Agency
HDPE – High Density Poly Ethylene

4.5 QUALITY CONTROL (QC) SAMPLING

In addition to the laboratory analysis of the groundwater samples, additional analysis will be included for QC measures, as required by the Category B sampling techniques. These samples will include field blank, trip blank, matrix spike/matrix spike duplicate (MS/MSD), and blind duplicate samples at a frequency of one sample per 20 field samples collected or per sample delivery group (SDG). QC samples will be analyzed for the same parameters as the accompanying samples, with the exception of any trip blanks, which will be analyzed for the VOC list only.

TABLE 2

FIELD SAMPLE AND QC SAMPLE QUANTITIES

Sample Type	Parameters	EPA Method[1]	Field Samples	QC Samples			
				Duplicate[3]	MS/MSD[3]	Equipment Blank[2]	Trip Blank[2]
Soil	TCL VOCs	EPA 8260C	TBD	1/20 (TBD)	1/20 (TBD)	NA	1 (Laboratory-Supplied)
	SVOCs, TAL Metals, Mercury, PCBs, and Pesticides	EPA 8270D, 6010C/7471B, 8082A, and 8081B	TBD	1/20 (TBD)	1/20 (TBD)	NA	NA
Groundwater	VOCs	EPA 8260	15	1	1	1	1
	CP-51 SVOCs	EPA 8270	13	1	1	1	NA
Soil Gas	VOCs	TO-15	4	1	NA	NA	1 Ambient Air
Indoor Air	VOCs	TO-15	TBD	1	NA	NA	1 Ambient Air (TBD)

Notes:
MS/MSD - matrix spike/matrix spike duplicate
TBD – To be determined based on planned work activities
NA – Not Applicable
[1] - NYSDEC July 2005 ASP Category B deliverables
[2] – One trip blank per shipment with VOC analyses
[3] - One MS/MSD and Duplicate sample per twenty field samples or sample shipment

4.6 SAMPLE HANDLING

4.6.1 Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody (COC) documents, and laboratory reports. All samples will be amended with a collection date at the end of the sample same in a year, month, day (YYYYMMDD) format. Blind duplicate sample nomenclature will consist of the sample type, followed by an "X"; MS/MSD samples nomenclature will consist of the parent sample name, followed by "MS/MSD"; and trip and field blanks will consist of "TB-" and "FB-", respectively, followed by a sequential number of the trip/field blanks collected within the SDG. Special characters, including primes/apostrophes (’), will not be used for sample nomenclature.

4.6.1.1. Site Management (SM) Sample Identification

All samples will be consistently identified in all field documentation, chain-of-custody documents and laboratory reports using an alpha-numeric code. Groundwater samples collected during the Site Management phase will be identified with "MW-" followed by groundwater monitoring well number. The field duplicate samples will be labeled with a dummy sample location to ensure that they are submitted as blind samples to the laboratory. Trip blanks and field blanks will be identified with "TB" and "FB", respectively. Table 3 provides examples of the sampling identification scheme for samples collected during the Site management activities.

Table 3
Sample Nomenclature

Sample Description	Sample Designation
Groundwater sample collected from groundwater monitoring well MW-07 on August 1, 2022	MW-07_20220801
Matrix spike/matrix spike duplicate sample of groundwater sample collected from groundwater monitoring well MW-07 on August 1, 2022	MW-07_20220801_MS/MSD
Blind duplicate sample of groundwater sample collected from groundwater monitoring well MW-07 on August 1, 2022	MW-X_20220801
Second trip blank collected on August 1, 2022	TB-02_20220801
Sub-slab soil vapor sample collected from sub-slab soil gas point SG-01 on August 1, 2022	SG-01_20220801
Indoor air sample collected from the basement floor of the building on August 1, 2022	IAQ-01_20220801
Soil reuse sample collected from 1 to 2 feet below basement grade on August 1, 2022.	RU-SB-01_20220801

4.6.1.2. Waste Classification

Any waste classification samples will be amended with "WC-" and the alphanumeric drum identification. Table 4 provides examples of the sampling identification scheme for proposed waste classification samples and any hotspot or tank excavation samples.

Table 4
Waste Classification Sample Nomenclature

Sample Description	Sample Designation
Waste classification sample collected from Drum 1 on August 1, 2022	WC-D1 20220801

Sample Labeling and Shipping

All sample containers will be provided with labels containing the following information:

- Project identification, including Site name, BCP Site number, Site address
- Sample identification
- Date and time of collection
- Analysis(es) to be performed
- Sampler's initials

Once the samples are collected and labeled, they will be placed in chilled coolers and stored in a cool area away from direct sunlight to await shipment to the laboratory. All

samples will be shipped to the laboratory at least twice per week. At the start and end of each workday, field personnel will add ice to the cooler(s) as needed.

The samples will be prepared for shipment by placing each sample in laboratory-supplied glassware, then wrapping each container in bubble wrap to prevent breakage, and adding freezer packs and/or fresh ice in sealable plastic bags. The COC form will be properly completed by the sampler in ink, and all sample shipment transactions will be documented with signatures, and the date and time of custody transfer. Samples will be shipped overnight (e.g., Federal Express) or transported by a laboratory courier. All coolers shipped to the laboratory will be sealed with mailing tape and a COC seal to ensure that the samples remain under strict COC protocol.

Sample Custody

Field personnel will be responsible for maintaining the sample coolers in a secured location until they are picked up and/or sent to the laboratory. The record of possession of samples from the time they are obtained in the field to the time they are delivered to the laboratory or shipped off-site will be documented on COC forms. The COC forms will contain the following information: project name; names of sampling personnel; sample number; date and time of collection and matrix; and signatures of individuals involved in sample transfer, and the dates and times of transfers. Laboratory personnel will note the condition of the custody seal and sample containers at sample check-in.

4.7 FIELD INSTRUMENTATION

Field personnel will be trained in the proper operation of all field instruments at the start of the field program. Instruction manuals for the equipment will be on file at the Site for referencing proper operation, maintenance, and calibration procedures. The equipment will be calibrated according to manufacturer specifications at the start of each day of fieldwork. If an instrument fails calibration, the project manager or QA/QC officer will be contacted immediately to obtain a replacement instrument. A calibration log will be maintained to record the date of each calibration, any failure to calibrate and corrective actions taken. The PID will be equipped with an 11.7 electron volt (eV) lamp and will be calibrated each day using 100 parts per million (ppm) isobutylene standard gas in accordance with the manufacturer's standards.

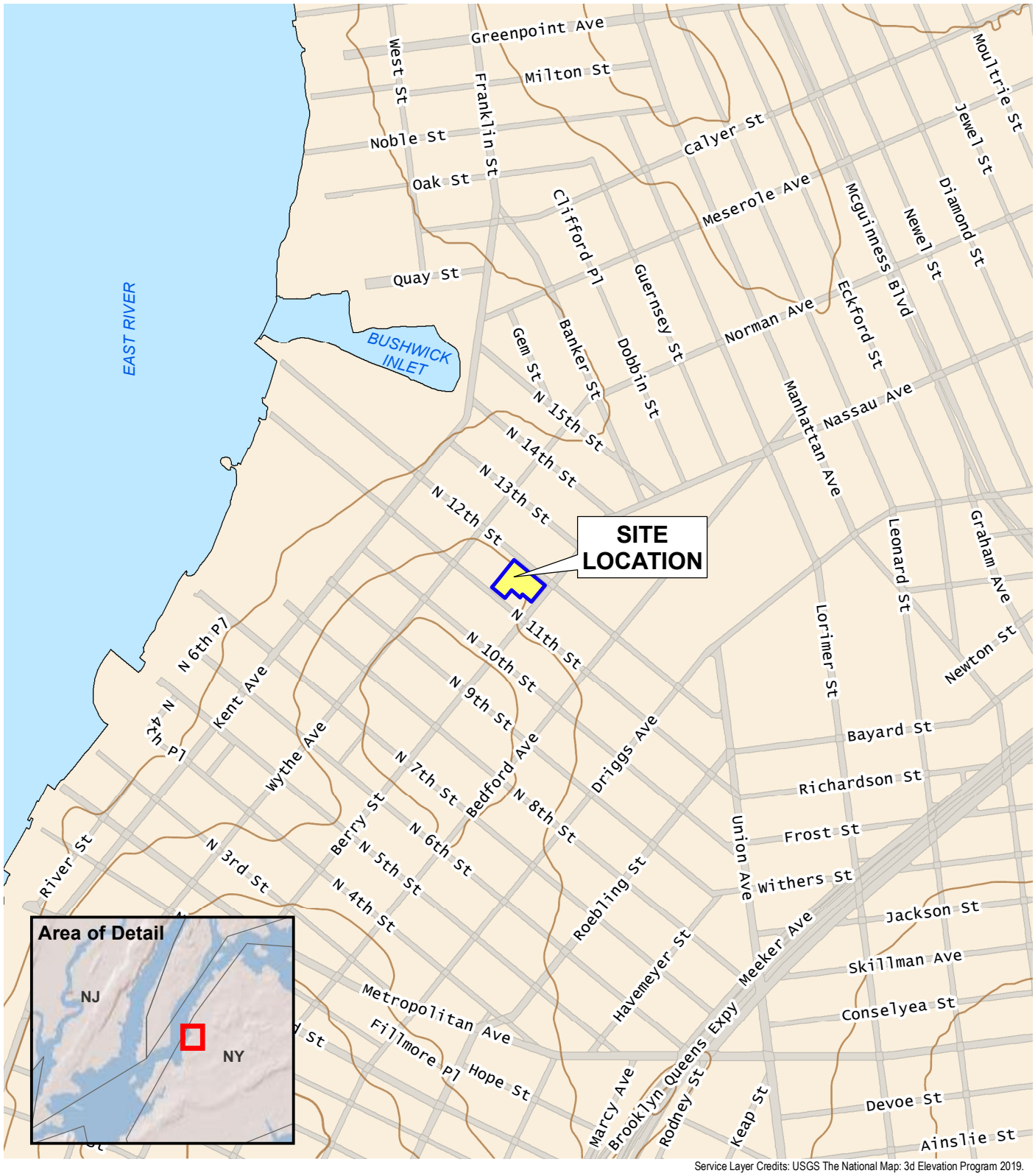
4.8 QUALITY ASSURANCE (QA)

All soil and groundwater laboratory analytical data will be reviewed by a third-party validator and a Data Usability Summary Report (DUSR) will be prepared to document the usability and validity of the data. The objective of the third-party validator is to provide an unbiased review to confirm that the laboratory followed all method and reporting requirements, and to provide a basis for making decisions about the minimum quality of environmental data that is sufficient to support risk assessment remedial performance decisions. The quarterly reports will include a detailed description of sampling activities, data summary tables, concentration map showing sample locations and concentrations, DUSR, and laboratory reports.

4.9 REPORTING OF DATA

All data generated during the monitoring activities will be submitted in the appropriate EQuIS™ EDD format.

FIGURES



Service Layer Credits: USGS The National Map: 3d Elevation Program 2019.

0 800 1,600

SCALE IN FEET

©2020 AKRF M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\GIS\11259 Fig 1 Site Location.mxd 3/3/2020 4:14:16 PM mvellieux

AKRF
440 Park Avenue South, New York, NY 10016

34 Berry Street
Brooklyn, New York

SITE LOCATION

DATE
3/3/2020

PROJECT NO.
11259

FIGURE
1

ATTACHMENT A

RESUMES OF PROJECT DIRECTOR, PROJECT MANAGER, PROJECT MANAGER ALTERNATE, AND FIELD TEAM LEADER

MARC S. GODICK, LEP

SENIOR VICE PRESIDENT

Marc S. Godick, a Senior Vice President of the firm, has 20 years of experience in the environmental consulting industry. Mr. Godick's broad-based environmental experience includes expertise in remedial investigation, design and implementation of remedial measures, environmental/compliance assessment, litigation support, and storage tank management.

RELEVANT EXPERIENCE

Queens West Development Project, AvalonBay Communities, Queens, NY

Mr. Godick managed one of the largest remediation projects completed to date under the New York State Department of Environmental Conservation (NYSDEC) Brownfields Cleanup Program (BCP). The remedy for the site, which was contaminated by coal tar and petroleum, included the installation of a hydraulic barrier (sheet pile cut off wall), excavation of contaminated soil under a temporary structure to control odors during remediation, a vapor mitigation system below the buildings, and implementation of institution controls. The investigation, remediation design, remedy implementation, and final sign-off (issuance of Certificate of Completion) were completed in two years. Total remediation costs were in excess of $13 million.

Williamsburg Waterfront Redevelopment, RD Management/L&M Equities/Toll Brothers, Brooklyn, NY

The project is one of the largest development projects in the Greenpoint/Williamsburg Rezoning Area, which includes the construction of nearly 1 million square feet of residential and retail space along the Williamsburg waterfront. The site had a variety of industrial uses, including a railyard, junk yard, and waste transfer station. As part of the City's rezoning, the site was assigned an E-designation for hazardous materials. Mr. Godick managed the preparation of the Phase I and II environmental site assessments, remedial action plan (RAP), and construction health and safety plan (CHASP). Mr. Godick obtained NYSDEC closure of an open spill associated with former underground storage tanks at the site. The NYCDEP-approved RAP and CHASP included provisions for reuse of the existing fill material, with the excess being disposed off-site, installation of a vapor barrier below the new buildings, installation of a site cap, and environmental monitoring during the construction activities. Mr. Godick is currently managing the environmental monitoring work that began in 2006. A Notice of Satisfaction has been issued by NYCDEP for the first phase of the development.

BACKGROUND

Education

M.E., Engineering Science/Environmental Engineering, Pennsylvania State University, 1998

B.S., Chemical Engineering, Carnegie Mellon University, 1989

Licenses/Certifications

Licensed Environmental Professional (License # 396) – State of Connecticut – 2003

40 Hour HAZWOPER and Annual Refresher Training, 1990-2008

Supervisors of Hazardous Waste Operations (8 Hour), 1990

Professional Memberships

Chair, Village of Larchmont/Town of Mamaroneck Coastal Zone Management Commission, 1997 - Present

Chair, Westchester County Soil and Water Conservation District, 2005 - Present

Member, NYSDEC Risk-Based Corrective Action (RBCA) Advisory Group for Petroleum-Impacted Sites, 1997

Community Leadership Alliance, Pace University School of Law, 2001

Years of Experience

Year started in company: 2002

Year started in industry: 1990

Landfill Closure & Compost Facility Application, White Plains, NY

Mr. Godick is currently managing the closure of a formal ash landfill, which is currently being utilized as a leaf and yard waste compost facility by the City of White Plains. The remedial investigation included on-site and off-site assessment of soil, groundwater, and soil gas to delineate the extent of methane and solvent contamination associated with the landfill. The landfill closure plan includes provisions for enhancing the existing cap, methane venting, and groundwater treatment for solvent contamination. Mr. Godick also managed the preparation of the compost facility permit application, which required modification to the facility's operations necessary to close the landfill and address other regulatory requirements.

Landfill Redevelopment – RD Management, Orangeburg, NY

Mr. Godick is currently managing the remediation of the former Orangeburg Pipe site under the NYSDEC Voluntary Cleanup Program. The site contains widespread fill material, which has fragments of Orangeburg pipe that is impregnated with asbestos and coal tar. The site is being redeveloped for retail use. The site's closure plan provides for reuse of all fill material on-site and methane mitigation (vapor barrier and passive sub-slab ventilation system) for all new buildings. The fill management activities will include dust and sediment control measures and air monitoring to prevent airborne dust in accordance with a closure plan, stormwater pollution prevention plan (SWPPP), and CHASP. In pervious areas, the site cap will consist of 2 feet of clean fill and a liner in larger areas.

National Grid – Halesite Manufactured Gas Plant Site, Town of Huntington, NY

Mr. Godick managed the remedial design and engineering work associated with remediation of National Grid's former manufactured gas plant (MGP) located in the Town of Huntington. The site is situated in a sensitive location along the waterfront, surrounded by commercial and residential properties, and half the property where the remediation was conducted is a steep slope. The remedy consisted of soil removal, oxygen injection, and non-aqueous phase liquid recovery. Mr. Godick was responsible for the development of the remedial work plans, design/construction documents, landscape architecture, confirmatory sampling, air monitoring, supervision, and preparation of close-out documentation in accordance with NYSDEC requirements.

Site Investigation–7 World Trade Center Substation, Con Edison, New York, NY

Mr. Godick managed the site investigation at the former 7 World Trade Center Substation in an effort to delineate and recover approximately 140,000 gallons of transformer and feeder oil following the collapse of the building. The project involved coordination with several crews, Con Edison, and other site personnel.

Site Investigation–Former Manufactured Gas Plant (MGP) Facilities, Con Edison, New York, NY

Mr. Godick managed site investigations at four former MGP facilities. The investigations at three of the four sites were completed at a Con Edison substation, flush pit facility, and service center, respectively. The details associated with the fourth site are confidential. Site characterizations at the substation and flush pit facility were conducted in preparation of expansion at these locations. The findings from these characterizations were used by Con Edison to make appropriate changes to the design specifications and to plan for appropriate handling of impacted materials and health and safety protocols during future construction activities.

Verizon, Investigation & Remediation, Various Locations, NY, PA and DE

Mr. Godick managed over 50 geologic/hydrogeologic assessments and site remediation projects related to petroleum releases at various facilities. Responsibilities included annual budgeting, day-to-day project management, development and implementation of soil and ground water investigation workplans, ground water modeling, risk evaluation, remedial action work plans, remedial design, system installation, waste disposal, well abandonment, and operation and maintenance. Many of the assessment and remedial projects followed a risk-based approach. Remedial technologies implemented included air sparging, soil vapor extraction, bioremediation, pump and treat, soil excavation, and natural attenuation.

Storage Tank Management, Verizon, Various Locations, NY, PA, DE, and MA

Mr. Godick managed the removal and replacement of underground and aboveground storage tank systems for Verizon in New York, Pennsylvania, Delaware, and Massachusetts. Responsibilities included the management of design, preparation of specifications, contractor bidding, construction oversight, project budget, and documentation. For selected AST sites, managed the development of Spill Control, Contingency and Countermeasures (SPCC) plans.

Brownfield Opportunity Area (BOA) Grant Program Services for the Town of Babylon, Wyandanch, NY

AKRF was retained by the Town of Babylon to prepare a blight study, market study, NYS BOA Step 2 Nomination, an Urban Renewal Plan, and a Generic Environmental Impact Statement (GEIS) as part of a revitalization and redevelopment effort for downtown Wyandanch. Mr. Godick was responsible for overseeing the environmental data collection effort for the 226 brownfields identified in the 105-acre project area, and for identifying strategic sites for which site assessment funding should be sought. He also prepared the Hazardous Materials section of the Wyandanch Downtown Revitalization Plan (which incorporates the Nomination, Urban Renewal Plan, and GEIS), involving a summary of available environmental reports, a review of regulatory records, and limited street-level site inspections.

Alexander Street Urban Renewal Plan, Master Plan, Brownfield Opportunity Area Plan, Yonkers, NY

AKRF was retained by the City of Yonkers to prepare an Urban Renewal Plan, Master Plan, Brownfield Opportunity Area Plan, and a Generic Environmental Impact Statement (GEIS) for a 153 acre industrial area along Alexander Street on the Yonkers Waterfront. Mr. Godick was responsible for the Hazardous Materials sections of the GEIS and Urban Renewal Plan. Mr. Godick managed the environmental data collection effort for the entire study area which involved review and summary of existing environmental reports, a review of regulatory records, and field inspections. The collected information was used to prioritize individual parcels for funding and remediation. The Master Plan for the area called for the development of a mixed-use neighborhood consisting of residential, neighborhood retail, and office space uses with substantial public open space, access to the Hudson River, and marina facilities.

SEMINARS, LECTURES & PUBLICATIONS

"Let Nature Do the Work – Onsite Stormwater Management," Westchester County Department of Parks, Recreation and Conservation, Fall 2003

"Water Pollution Control and Site Assessments and Audits," Environmental Health and Safety Issues Course, Building Owners and Managers Institute (BOMI), 1997-1999

"Hydrogeologic and Geological Aspects of Tank Closures and Remedial Action," Underground Storage Tanks Course, Government Institutes, Summer 1996, Fall 1997

MARCUS SIMONS

SENIOR VICE PRESIDENT

Marcus Simons is a Senior Vice President of AKRF with 20 years of environmental consulting experience, specializing in the assessment and cleanup of contaminated sites, including federal and state superfund, RCRA, TSCA, brownfield, voluntary cleanup and spill sites. His expertise includes health risk assessment, development of sampling plans, economic evaluations of remedial alternatives, and regulatory analysis. He is also AKRF's Health and Safety Officer with extensive experience of Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) issues during sampling and remediation of contaminated sites.

Mr. Simons directs much of AKRF environmental due diligence work (recently managing environmental due diligence on Tishman/Blackrock's Peter Cooper/Stuyvesant Town acquisition, reportedly the largest real estate transaction in US history), including supervising preparation of numerous Phase I and Phase II Environmental Site Assessments, as well as more complex multi-site and litigation-related projects. Mr. Simons manages preparation of the contaminated-materials portions of AKRF's Environmental Impact Statements and Environmental Assessments and has experience with procedures for hazardous material requirements under NEPA and New York SEQRA/CEQR and E-designation programs. He also has extensive experience in statistics, selection of sites for controversial facilities, and federal and state wetland regulations and waterfront permitting. In addition to analytical work, Mr. Simons has considerable experience in presenting results to regulatory agencies and the general public.

BACKGROUND

Education

M.S., Engineering and Public Policy, Carnegie-Mellon University, 1988

M.A. and B.A. (Honors), Mathematics/Engineering, Cambridge University, England, 1986

Certifications

Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) – 40 Hour Site Worker and 8 Hour Site Supervisor

Years of Experience

Year started in company: 1995

Year started in industry: 1988

Mr. Simons has managed some of the most complex cleanup sites in New York State including: the recently completed cleanup of a 12-acre PCB-contaminated former utility property in Flushing, Queens where a 3 million square foot retail/residential building is nearing completion (remediation was performed under the State Brownfield Cleanup Program, though the site was also subject to City jurisdiction under its E-Designation program); cleanup of the nation's largest former dental factory in Staten Island for reuse as single family housing; the investigation of several former manufactured gas plants; and the investigation and remediation associated with the reconstruction of the West Side Highway and Hudson River Park in Manhattan (from the Battery to 59th Street). Mr. Simons also has extensive experience with transportation projects (Second Avenue Subway, MTA/LIRR East Side Access, Cross Harbor Freight Movement Study, Route 9A Reconstruction), large-scale rezoning projects (Long Island City, Downtown Brooklyn, Jamaica) and public and private redevelopment work (Atlantic Yards, School Construction Authority, Queens West).

RELEVANT EXPERIENCE

CE Flushing Site, Flushing, NY

Mr. Simons directed the remediation of a former industrial site in Flushing, Queens, NY prior to its redevelopment as a 3 million square foot retail/residential complex. The property was cleaned up under the NYS Department of Environmental Conservation Brownfield Cleanup Program and the NYC Department of Environmental Protection's E-Designation requirements. The remedial measures included the removal of aboveground and underground storage tanks, excavation and off-site disposal of TSCA, RCRA and non-hazardous wastes, NAPL removal, and removal and investigation of on-site drainage structures. The remediation and subsequent construction involved obtaining (or obtaining waivers from) numerous permits including those for NYSDEC Tidal Wetlands, NYSDEC Long Island Wells, NYSDEC SPDES/Stormwater and NYCDEP Sewer Use.

Peter Cooper Village/Stuyvesant Town, New York, NY

Mr. Simons directed the purchaser's environmental due diligence efforts for the bidding and subsequent acquisition of this 80-acre property in Manhattan. Much of the 110-building complex is underlain by former manufactured gas plants and Con Edison entered the site into NYSDEC's Voluntary Cleanup Program. Going forward Mr. Simons will manage oversight of activities that involve disturbance of MGP-contaminated soils, as well as future testing and potentially remediation.

MTA New York City Transit Manhattan East Side Transit Alternative (MESA)/Second Avenue Subway, New York, NY

Mr. Simons directed the contaminated material assessment for this multi-billion dollar transit initiative that would provide subway service to Manhattan's East Side. The assessment identified several hundred facilities along the alignment that could have impacted soil and/or groundwater and could require special materials handling and enhanced health and safety procedures. Additional evaluation of these sites is underway.

Ferry Point Park, Bronx, NY

Mr. Simons developed the material acceptance criteria (soil standards for capping materials) for the development of Ferry Point Park (including a golf course) in the Bronx. The New York City Department of Environmental Protection DEP and the New York State Departments of Health (DOH) and Environmental Conservation (DEC) agreed for the first time to relax their strict (TAGM 4046) criteria for clean soil, based on statistical analyses of background conditions and risk-based modeling.

Prince's Point, Staten Island, NY

Mr. Simons managed the complex cleanup (including the relocation of a contaminated tidal creek) of the nation's largest former dental factory site on Staten Island's waterfront. The site was on the State Superfund list. The future use of the site as single-family residential property entailed extensive negotiations with NYSDEC and NYSDOH. The project required obtaining (or obtaining waivers from) numerous permits including those for NYSDEC Tidal and Fresh Water Wetlands, USACOE (Nationwide) Permits, NYSDEC Coastal Erosion Hazard Area, NYSDEC SPDES and Stormwater, FEMA Modifications to Land in Floodplain, and USEPA Notification of PCB Waste Activity.

Route 9A Reconstruction, New York, NY

AKRF directed extensive studies for the reconstruction in Lower Manhattan proposed by the New York State Department of Transportation (NYSDOT) in cooperation with the Federal Highway Administration (FHWA). The project is arguably the most complex environmental analyses performed for a federally funded transportation project in New York City in the last 10 years. The firm was responsible for all environmental tasks as well as the preparation for the Draft, Supplementary,

and Final Environmental Impact Statements (EISs) and Section 4(f) Evaluation for this 5-mile $250 million reconstruction of Route 9A as part of the recovery effort following the events of September 11th, 2001. Mr. Simons managed the extensive hazardous materials investigations and prepared the contract specifications for contaminated soil and tank removal, including Health and Safety oversight.

Hudson River Park, New York, NY

Mr. Simons is managing hazardous materials issues for the ongoing Hudson River Park construction, located adjacent to the Route 9A roadway. Construction is ongoing and Mr. Simons directs health and safety oversight and remediation during construction.

Jamaica Rezoning, Queens, NY

As part of the preparation of an Environmental Impact Statement, Mr. Simons managed the hazardous materials assessment of a multi-block area. In addition to conducting the assessment, Mr. Simons made recommendation as to the properties where "E-Designations" (city-recorded institutional controls on future development) should be placed.

Outlet City, Long Island City, Queens, NY

In Long Island City, Mr. Simons managed the investigation and interim remediation of an old factory complex where large volumes of creosote were spilled. The investigations and interim remedial measures (IRMs) took place under the New York State's Voluntary Cleanup Program (VCP).

MTA/LIRR East Side Access Project, New York, NY

Mr. Simons managed the hazardous materials investigations for multiple sites in the Bronx, Manhattan, and Queens associated with the Environmental Impact Statement (EIS) for the Long Island Rail Road connection to Grand Central Terminal. Mr. Simons continues to be involved in health and safety oversight related to the construction of the project.

New York City Department of Transportation, Lead Paint Removal and Disposal on Bridges Project, New York, NY

Mr. Simons conducted a regulatory analysis of related to the removal of lead paint from nearly 800 bridges. This analysis included an evaluation of the regulatory compliance of various proposed procedures with federal and state hazardous and solid waste management requirements.

American Felt and Filter Company, New Windsor, NY

Mr. Simons prepared a Remedial Investigation (including exposure assessment) and Feasibility Study for the country's oldest active felt manufacturing facility, located in Orange County. This solvent-contaminated site is on the State Superfund List.

REBECCA KINAL, P.E.

VICE PRESIDENT

Rebecca Kinal has over 20 years of experience in the assessment and remediation of soil and groundwater contamination and other hazardous/non-hazardous waste problems. Ms. Kinal's experience includes environmental due diligence, soil and groundwater investigations, leaking underground storage tank studies, soil gas/vapor intrusion surveys, and oversight of small- and large-scale remediation programs, including design of groundwater remediation systems and vapor mitigation systems. She has directed numerous Phase I and Phase II investigations and remediation programs, many of them in conjunction with commercial/residential developers, law firms, lending institutions, and public agencies. She is experienced in the cleanup of contaminated properties under New York State Brownfield Cleanup Program (BCP) regulations and the New York City "E-designation" program. As a part of this work, her duties have included technical and report review, proposal writing, scheduling, budgeting, and acting as liaison between clients and regulatory agencies, and project coordination with federal, state, and local authorities.

BACKGROUND

Education

M.S., Hydrogeology, Rensselaer Polytechnic Institute, 1995

B.S., Civil Engineering, Lafayette College, 1992

Licenses/Certifications

State of New York, P.E. Registration No. 082046, 2004

Years of Experience

Year started in company: 2000

Year started in industry: 1996

RELEVANT EXPERIENCE

New York City School Construction Authority On-Call Contract for Environmental Consulting Services, Various Sites, NY

Ms. Kinal serves as the project manager for AKRF's on-call hazardous materials consulting contract with the New York City School Construction Authority for over 8 years. For potential new school sites, assignments include initial due diligence, Phase I environmental site assessments, (ESAs) and subsurface investigation of soil, groundwater, and soil vapor to determine the suitability of a site for development as a school, likely remediation requirements, and associated costs. For sites undergoing design and development, assignments include preparation of remediation plan, contract specifications, and design drawings. The work has also included conducting indoor air quality testing, vapor intrusion assessments, preparation of specifications, supervision of storage tank removals, and investigation and remediation of spills for existing schools. Due to the sensitivity of school sites, work under this contract is often conducted on short notice and during non-school hours.

USTA National Tennis Center, Queens, NY

AKRF prepared an EIS for the New York City Departments of City Planning (DCP) and Environmental Protection (DEP) as co-lead agencies to analyze the expansion of the National Tennis Center, which includes

multiple improvements and construction projects at the USTA campus over several years. As part of the EIS requirements, AKRF prepared a Remedial Action Plan for implementation during the proposed project's construction. In accordance with the RAP, vapor mitigation systems were incorporated into the design for several of the proposed structures at the facility, including two new stadiums, a new transportation center, and several practice court facilities. Ms. Kinal prepared the specifications and design drawings for the vapor mitigation and is providing on-going construction support to review contractor submittals and inspect the vapor barrier and sub-slab depressurization system installations.

Montefiore Medical Center, Various Locations, NY

Ms. Kinal provides due diligence assistance to Montefiore Medical Center (MMC) for the ongoing expansion of their facilities, primarily in the Bronx and Westchester County. She conducts and manages environmental due diligence tasks related to their property transactions, including Phase I Environmental Site Assessments (ESAs), Phase II investigations, and geophysical surveys. She also assists MMC in making decisions with respect to environmental risk issues.

Queens West Development Project, Long Island City, NY

For over 20 years, AKRF has played a key role in advancing the Queens West development, which promises to transform an underused industrial waterfront property into one of largest and most vibrant mixed-use communities just across the East River from the United Nations. AKRF has prepared an Environmental Impact Statement that examines issues pertaining to air quality, land use and community character, economic impacts, historic and archaeological resources, and infrastructure. As part of the project, AKRF also undertook the largest remediation ventures completed to date under the NYSDEC Brownfields Cleanup Program (BCP). Ms. Kinal helped prepare the Remedial Work Plan (RWP) and oversaw the remediation of Parcel 9, a 1.8-acre former industrial site. Remediation includes installation of a sheet pile containment wall, excavation of coal tar- and petroleum-contaminated soil under a temporary structure to control odors during remediation, vapor mitigation for the future buildings, and institutional controls. Upon completion of the remediation activities, Ms. Kinal managed the preparation of a Final Engineering Report (FER) to document the clean-up activities. The NYSDEC issued a Certificate of Completion (COC) for the Parcel 9 site in December 2006. Ms. Kinal continues to oversee post-remediation monitoring and site management activities to ensure that the remedy remains in-place and effective.

Roosevelt Union Free School District, Roosevelt, NY

Ms. Kinal is managing environmental investigation and remediation activities for the sites of three new elementary schools and a new middle school in Roosevelt, New York. Remediation activities include removal/closure of contaminated dry wells and underground petroleum storage tanks, and excavation and off-site disposal of petroleum- and pesticide-contaminated soil.

Proposed NYC Public School Campus, Bronx, NY

Ms. Kinal provided environmental consulting services to the selected environmental remediation contractor for this former manufactured gas plant in the Mott Haven neighborhood of the Bronx, which was remediated under the NYSDEC BCP. These services included: preparation of an in situ sampling plan and excavation plan for waste characterization and disposal; supervision of waste characterization sampling activities; development and implementation of a community air monitoring program during all remediation activities; and daily reporting to the NYC School Construction Authority.

National Grid – Halesite Manufactured Gas Plant Site, Town of Huntington, NY

Ms. Kinal served as the project manager for the remedial design and engineering work associated with remediation of National Grid's former manufactured gas plant (MGP) located in the Town of Huntington. The site is situated

in a sensitive location along the waterfront, surround by commercial and residential properties, and half the property where the remediation was conducted is a steep slope. The remedy consisted of soil removal, oxygen injection, and non-aqueous phase liquid recovery. Ms. Kinal developed the remedial work plans, design/construction documents, and managed environmental oversight of the remedial work, including waste characterization and tracking, confirmatory endpoint sampling, air monitoring, and reporting to the NYSDEC. After the remediation work was completed, Ms. Kinal prepared appropriate close-out documentation in accordance with NYSDEC requirements.

Shell Service Station, Millwood, NY

Ms. Kinal planned and oversaw a Phase I Environmental Site Assessment and Phase II Subsurface Investigation of this active gasoline station in northern Westchester County. The Phase I/Phase II investigations were performed for the potential buyer of the property who wished to redevelop it with a more modern service station and convenience store. Ms. Kinal also prepared a conceptual remediation plan to address several areas of petroleum contamination identified during the Phase II. The plan, which was approved by NYSDEC, will be implemented in conjunction with the site redevelopment activities to achieve closure for several spills reported at the site.

Pelham Plaza Shopping Center Site Investigation & Remediation, Pelham Manor, NY

Ms. Kinal managed a Site Investigation at Pelham Plaza, an approximately ten-acre site that formerly contained a manufactured gas plant. The site was investigated under a voluntary clean-up agreement entered into with the NYSDEC by the site owner. The site investigation included advancing over 100 soil borings with continuous soil sampling to bedrock, installing monitoring and recovery wells, and conducting test pitting both indoor and outdoor locations to collect soil and groundwater samples and determine the extent of Non-Aqueous Phase Liquid (NAPL). The investigation also included: soil gas sampling to determine contaminant concentrations in the vapors beneath the foundation of an on-site retail store; sediment sampling in an adjacent creek to identify off-site impacts; and a tidal survey to determine tidal influence on groundwater levels at the site. Ms. Kinal also oversaw on-going interim remedial measures, which include biweekly pumping of recovery wells to remove dense NAPL (DNAPL) from the site subsurface.

Shaws Supermarket Redevelopment Project, New Fairfield, CT

Ms. Kinal managed the Remedial Investigation (RI) for an approximately nine-acre shopping center site that was contaminated by releases from former dry cleaning operations. The site was being redeveloped with a new supermarket and separate retail stores. The investigation included the installation of monitoring wells in the intermediate overburden aquifer and bedrock aquifer, sampling of existing and newly installed wells, geophysical logging in bedrock wells, and pump testing in intermediate and bedrock wells. Ms. Kinal prepared a Remedial Action Work Plan (RAWP) based on results from the RI, which included a groundwater pump and treat system to contain a plume of perchlorethylene (PCE)-contaminated groundwater, and excavation and disposal of contaminated soil in the presumed source area. Following CTDEP approval of the RAWP, Ms. Kinal prepared bid specifications for soil excavation and remediation system installation, and oversaw their implementation. Ms. Kinal also prepared NPDES permit applications for discharges from construction dewatering and the groundwater remediation system, and conducted associated discharge monitoring.

Yankee Stadium, Bronx, NY

Ms. Kinal performed the hazardous materials analysis for the Draft Environmental Impact Statement for the proposed new Yankee Stadium. The analysis included a Phase I Environmental Site Assessment of the entire project area and Subsurface (Phase II) Investigation in areas where environmental conditions were identified. The Phase II investigation included geophysical surveys to search for potential underground storage tanks; and soil, soil gas, and groundwater sampling at over 40 locations to determine potential environmental impacts during and after the proposed construction.

Avalon on the Sound, New Rochelle, NY

Ms. Kinal oversaw environmental investigation and soil remediation during the construction of two luxury high-rise apartment buildings and an associated parking garage. Investigation activities included an electromagnetic survey to search for possible underground storage tanks, and subsurface sampling to characterize soil and groundwater. Remediation activities included removing underground storage tanks, excavating and disposing of soil contaminated with volatile and semi-volatile organic compounds, and collecting end-of-excavation confirmation samples.

Davids Island Environmental Audit, New Rochelle, NY

Ms. Kinal managed the hazardous materials portion of the audit of this undeveloped island site, including a Phase I Environmental Site Assessment (ESA) and Subsurface (Phase II) Investigation in areas where environmental conditions were identified. The Phase II investigation included collecting soil samples from more than 100 locations and analyzing them for targeted compounds, including volatile organic compounds, semi-volatile compounds, metals, pesticides, and polychlorinated biphenyls (PCBs). Ms. Kinal also oversaw an electromagnetic (EM) survey conducted to identify the location of suspected underground storage tanks on the island. Based on soil sample results, Ms. Kinal estimated the volume of contaminated soil requiring remediation and prepared cost estimates for soil excavation and for transportation and disposal of contaminated soil and hazardous materials.

Outlet City Site Investigation, Queens, NY

Ms. Kinal prepared a work plan for remedial investigation of the Outlet City site, a property in Long Island City that was formerly occupied by a manufacturer of industrial cleaners and pharmaceuticals. The site is being investigated and remediated under the NYSDEC voluntary clean-up program. In preparing the work plan, Ms. Kinal evaluated results from several previous investigations and conducted a limited groundwater sampling program to determine future data needs for designing remediation of creosote-contaminated soil and groundwater. The work plan included additional soil and groundwater sampling, a tidal survey to determine tidal influence on groundwater levels, and pilot free product recovery testing. Ms. Kinal also helped design a venting system for an on-site basement and performed exposure calculations for the vented vapors.

Yonkers Waterfront Redevelopment Project, Yonkers, NY

For this redevelopment along Yonkers' Hudson River waterfront, Ms. Kinal supervised the remediation of Parcels H and I that were contaminated with hazardous soil. During the remediation process, she reviewed the subcontractor health and safety plans, delineated the areas of excavation, and oversaw field activities to ensure compliance with the specifications and appropriate regulations. This property was remediated under the NYSDEC Environmental Restoration Program (ERP).

U.S. Post Office Main Vehicle Maintenance Facility, Washington, D.C.

While with another firm, Ms. Kinal designed and supervised the installation of a remediation system to treat petroleum-contaminated groundwater. Ms. Kinal also established O&M and monitoring protocols to ensure efficient operation of the air sparging/soil vapor extraction system, and to monitor contaminant recovery/degradation rates.

Aberdeen Proving Ground Building 4025 Site, Aberdeen, MD

While with another firm, Ms. Kinal provided services for this leaking underground storage tank site, Ms. Kinal planned and oversaw investigation and pilot testing activities to delineate contamination and determine feasible in-situ remediation options. Investigation activities included soil and groundwater sampling using a direct-push (Geoprobe) rig and mobile laboratory. Pilot testing included in-situ respirometry testing, and field testing of bioremediation and free-product recovery technologies.

BRYAN ZIEROFF, LEP

SENIOR HYDROGEOLOGIST

Bryan Zieroff has 15 years of experience in the environmental consulting industry. Mr. Zieroff's experience includes the conceptual design, implementation and reporting of detailed field investigations including assessments of ground-water supplies for residential, municipal and industrial users, and evaluation, monitoring and remediation of soil and ground-water contamination for sites regulated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), Connecticut's Remediation Standard Regulations, and by the New York State Department of Environmental Conservation's (New York State Department of Environmental Conservation's (NYSDEC)) cleanup programs. These studies include investigations at sites impacted by petroleum products, chlorinated solvents, metals and landfill leachate. Mr. Zieroff's tasks often include characterization of the extent of contamination in soil, ground water, and soil vapor, evaluation of compliance with the established regulatory criteria, and operation and maintenance of remediation systems. Mr. Zieroff's familiarity with various field investigation techniques enhances his management skills.

BACKGROUND

Education

B.S., Geological Sciences, The Ohio State University, 1994

Licenses/Certifications

Certified Professional Geologist-American Institute of Professional Geologists, License # CPG-11197

40 Hour HAZWOPER and Annual Refresher Training

Supervisors of Hazardous Waste Operations (8 Hour)

Professional Memberships

American Institute of Professional Geologists

Association of Ground-Water Scientists and Engineers (National Ground Water Association)

Environmental Professionals' Organization of Connecticut (EPOC)

Years of Experience

Year started in company: 2006

Year started in industry: 1995

RELEVANT EXPERIENCE

Gedney Way Leaf and Yard Waste Composting Facility, White Plains, NY

Mr. Zieroff is Project Manager for a remediation and landfill closure project at an existing composting facility. The project included documenting the entire disposal history and completing a site-wide investigation to confirm the extent of a solvent release and to provide data necessary to complete landfill closure. The investigation was required to satisfy the requirements in the NYSDEC DER-10 and 6NYCRR Part 360. After receiving state approval of the Site Investigation Report, the project has moved into the remediation and landfill closure design phase. The remedial design includes the testing and implementation of a chemical oxidation injection program, and landfill closure includes design, state approval, and construction of a landfill cap.

New City Plaza, New City, NY

Mr. Zieroff is Project Manager for an investigation and remediation project at a former dry cleaning facility. Investigation and remediation at the site currently are being conducted under review of the NYSDEC Brownfield Cleanup Program. Tasks have included preparation and state approval of a Site Investigation Work Plan, Site Quality Assurance Project Plan, Health and Safety Plan, a Community Participation Plan, and completion of the investigation phase of the Brownfield's program. Interim Remedial activities include contamination source removal from soil and installation of a sub-slab depressurization system to address soil vapor. A feasibility study is currently being completed to determine the optimal remedial approach for site-wide remediation.

Orangeburg Pipe Site, Orangeburg, NY

Mr. Zieroff completed a subsurface investigation to determine the extent of soil and groundwater contamination at the former Orangeburg Pipe facility. The investigation results were used to develop a Remedial Action Plan to address solid waste, petroleum contamination, worker safety during site development, and capping requirements to satisfy the NYSDEC Voluntary Remediation Program. The Remedial Action Plan included a Heath and Safety Plan, Community Air Monitoring Plan, and specifications for soil management, a vapor mitigation system and dewatering procedures during the construction of multiple commercial buildings.

Magna Metals Facility, Cortlandt, NY

Mr. Zieroff managed a soil-gas investigation project at an existing commercial warehouse and office building. The project included installation of permanent soil gas sampling points and completion of a sampling program that met the requirements of the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York. Site activities included a pre-sampling investigation with the NYSDOH to document materials storage, air flow specifications, historical uses, site uses and areas of concern for sub-slab and ambient air sampling. The investigation work was being conducted to satisfy the NYSDEC consent order.

Paragon Paint Company Facility, Long Island City, NY

Mr. Zieroff was Project Manager for an investigation and remediation project at a former paint manufacturing facility. The project has included a multiple subsurface investigations to determine the extent of solvent and petroleum contamination at the site. All phases of remediation at the site are being completed under review of the NYSDEC Brownfield Cleanup Program. Tasks include completion and state approval of a Site Investigation Work Plan, Quality Assurance Project Plan, Health and Safety Plan, Community Participation Plan, Remedial Action Plan, and Final Remediation Report.

Pathmark Stores Site, Bronx, NY

Mr. Zieroff completed a Remedial Action Plan, Construction Health and Safety Plan and a Soil Management Plan for a former materials storage facility associated with Manhattan College. The plans were completed to provide worker safety and soil handling guidelines during the construction of a large retail facility and parking garage. Development activities at the site were conducted under oversight of the New York City Department of Environmental Protection (NYCDEP). A Notice of Satisfaction was received after project completion.

Yale and Towne Site, Stamford, CT

Mr. Zieroff provided oversight services for a remediation project at a former industrial site. The site included over 35 buildings and 87 areas of environmental concern that required investigation and remediation. Tasks included providing technical support in understanding the Connecticut regulatory requirements, investigation and remediation costs, and confirmation of appropriate schedules to address the environmental issues during redevelopment of the project site.

Aluminum Company of America (ALCOA) Facility, Guilford, CT

Mr. Zieroff managed a ground-water remediation project at an existing aluminum manufacturing facility. The project included soil, vapor and ground-water sampling to confirm the extent of a solvent release, determination of ground water and aquifer characteristics, operation and maintenance of a ground-water pump-and-treat system and compliance sampling in association with a Connecticut Department of Environmental Protections (CTDEP) consent order.

Coats North America Facility, Watertown, CT

Mr. Zieroff was the Project Manager for site compliance work at an existing synthetic treads facility. The project included an evaluation of activities, chemical uses and waste handling practices to determine areas of environmental concern. Investigations to determine the status of these areas included installation of monitoring wells, soil and ground-water sampling, soil-vapor sampling, liquid storage tank removal and Resource Conservation and Recovery Act (RCRA) closure of waste storage areas. The project activities were completed in compliance with the CTDEP property transfer program.

United Parcel Service, Storm Water Management, 9 Connecticut Facilities

Mr. Zieroff managed the design and implementation of a storm water pollution prevention project at nine United Parcel Service facilities. The project included analysis of drainage areas, determination of sheet flow characteristics and the collection of storm-water discharge samples and SMR reporting in accordance with the CTDEP General Permit for the Discharge of Storm Water.

Meriden Enterprise Center, Meriden, CT

Mr. Zieroff developed and directed a subsurface investigation to determine the nature and extent of contamination related to releases from multiple underground storage tank farms, silverware plating, machining and furniture stripping operations. Project activities included ground-penetrating radar, drilling of test borings, installation of monitoring wells, developing a conceptual site model for the established releases and preparing a report detailing remedial alternatives for the property and owner requirements under the CTDEP Property Transfer Act.

Development properties in Kent, Ridgefield, and Greenwich, CT and Mahopac and Brewster, NY

Mr. Zieroff directed an evaluation and testing program of bedrock water-supply wells to determine long-term yield, impact on local users, and water quality results. The project included compilation of data, construction of hydrographs, determination of aquifer characteristics and reporting.

Bettsville Quarry, Bettsville, OH

Mr. Zieroff directed a pumping test of dewatering wells to determine yield requirements for dewatering a carbonate rock quarry. The dewatering program included a determination of offsite impacts to local ground-water users. Mr. Zieroff developed an offsite monitoring program to document and protect local users during the quarry dewatering process.

Burning Tree Country Club, Greenwich, CT

Mr. Zieroff directed an in-situ percolation test to determine recharge rates for a proposed upgrade to the facility septic system. The project included compilation of slug test data and software analysis to determine K values.

MARK JEPSEN

ENVIRONMENTAL SCIENTIST

Mark Jepsen is an Environmental Scientist in AKRF's Hazardous Materials group. He has a great deal of experience in both environmental science and natural resources, including environmental remediation and consulting, groundwater quality and soil science, hydrology, and geology.

Since Joining AKRF at the beginning of 2014, Mr. Jepsen has overseen a wide variety of environmental investigations. He has performed oversight at large scale construction sites entailing complex remediation techniques. He has performed various Phase I site visits and reports. Additionally, Mr. Jepsen has followed up these Phase I investigations with performing Phase II remedial investigations including soil, groundwater, and soil vapor sampling. Also, Mr. Jepsen has a great deal of experience creating environmental reports discussing results found during the preliminary and supplemental investigations, Remedial Action Work Plans (RAWPs), Construction Health and Safety Plans (CHASP), Remedial Closure Reports, Environmental Bid Specifications and Design Coordination. Mr. Jepsen has a knowledgeable background in environmental issues and challenges pertaining to the New York metropolitan area and technical guidelines. Mr. Jepsen has a great deal of experience working on projects involved with multiple governmental regulators including NYSDEC, NJDEP, NYCDEP, and NYCOER.

Before joining AKRF, Mr. Jepsen worked for Bluestone Environmental Services in Somerset, New Jersey. He was responsible for performing a wide array of field work activities including groundwater sampling, monitoring well gauging, soil sampling, and more for Bluestone's various clients including: ExxonMobil, International-Matex Tank Terminals (IMTT) and various gas stations. He was responsible for maintaining an understanding of large and active remediation sites and dealing with an extensive groundwater monitoring well network, as well as acting as an on-site safety supervisor for all Bluestone employees and subcontractors.

BACKGROUND

Education
B.S., Environmental Science, The Ohio State University, 2012

New Jersey Regulatory Seminars
Combined Sewer Outfalls (CSO) for LSRPs: Remediation Alternatives to Better Manage Storm Water

Certifications
40 Hour OSHA HAZWOPER – annual refresher every year
10 Hour OSHA Construction Training
Gold Certified Brownfield Professional by New York City Office of Environmental Remediation
Transportation Worker Identification Credential (TWIC)
NYSDEC Erosion and Sediment Control Inspector
Boating license

Years of Experience
Date started at AKRF: March 2014
Prior industry experience: Bluestone Environmental Services (NJ) – January 2013 to March 2014

RELEVANT AKRF EXPERIENCE

432 East 14th Street, Environmental Management Specifications, Design Coordination and Pre-Characterization of Soil for Off-site Disposal, New York, NY

Mr. Jepsen supported AKRF's preparation of Environmental Management Specifications and Design Coordination, and collection and laboratory analysis of soil samples to pre-characterize soil beneath the Site for off-site disposal. Mr. Jepsen also performed the Phase II remedial investigation of this site which included soil, groundwater, and soil vapor sampling. Mr. Jepsen was also responsible for construction oversight during the foundation excavation for the proposed building. Following completion of excavation, Mr. Jepsen was responsible for inspecting the vapor barrier system installed as an engineering control for the proposed building. He has also been involved with creating the Remedial Closure Report.

77 Commercial Street, Environmental Services, Greenpoint, NY

Mr. Jepsen supported AKRF's environmental services, including Preparation of a Remedial Investigation (Phase II) Work Plan; Remedial Investigation (RI) and Report; Preparation of a Remedial Action Work Plan (RAWP) and Construction Health and Safety Plan (CHASP); Pre-Characterization of Soil for Off-site Disposal; Environmental Monitoring; Remedial Closure Report; and Environmental Bid Specifications and Design Coordination.

Bronx Pro 2264-2272 Morris Avenue, Environmental Consulting Services, Bronx, NY

Mr. Jepsen is supporting AKRF's environmental consulting services for this site including, Phase I Environmental Site Assessment (ESA) and update, Phase II remedial site investigations and subsurface sampling, ongoing construction oversight and vapor barrier inspections.

Memorial Sloan Kettering Cancer Center Hospital 74th Street, Environmental Services, New York, NY

Mr. Jepsen supported AKRF's environmental services, including construction oversight and air monitoring, groundwater sampling, and monitoring well decommissioning. Also, Mr. Jepsen has overseen large scale UST closure and removal at this site. Mr. Jepsen was responsible for the on-site implementation of AKRF's Remedial Action Work Plan (RAWP) and Construction Health and Safety Plan (CHASP). He has also been involved with creating the Remedial Closure Report.

School Construction Authority, New York, NY

Under an on-call contract, AKRF provides the New York City School Construction Authority (NYCSCA) with hazardous materials consulting services. Mr. Jepsen is involved with various due diligence and environmental assessment projects including Phase I Environmental Site Assessments (ESAs); Phase II (Subsurface) Environmental Site Investigations (soil, groundwater and soil vapor intrusion investigations); Indoor Air Quality (IAQ) Assessments; Underground Storage Tank (UST) and Aboveground Storage Tank (AST) inspections relating to boiler conversions; and peer review of other consultant's due diligence reports.

Indoor Air Quality Monitoring, New York, NY

Mr. Jepsen has performed a variety of indoor air quality investigations and surveys at sites including educational institutions and various residential buildings. Mr. Jepsen performed interviews pertaining to environmental site conditions and background with property owners and operators.

11 Greene Street, Environmental Consulting Services, New York, NY

Investigation and remediation of the Site is being conducted to satisfy NYC Office of Environmental Remediation (NYCOER) requirements under the Voluntary Clean-Up Program (VCP) and CEQR. Mr. Jepsen is supporting AKRF's environmental consulting services for this site including Waste Classification testing and delineation, preparation of a Remedial Investigation (Phase II) Work Plan; Remedial Investigation (RI) and Report; Preparation

of a NYCDEP Dewatering Application and Permit; Preparation of a Remedial Action Work Plan (RAWP) and Construction Health and Safety Plan (CHASP); Pre-Characterization of Soil for Off-site Disposal; Environmental Monitoring; and Environmental Bid Specifications and Design Coordination.

3200 Jerome Avenue, Environmental Consulting Services, Bronx, New York

AKRF conducted a Phase I ESA and an Indoor Air Quality Survey of this property in the Bronx during due diligence investigations for the NYCSCA which identified levels of trichloroethene (TCE) in indoor air that exceeded the New York State Department of Health (NYSDOH) standards. NYCSCA subsequently terminated its lease of the site and discontinued its use as a school. Following the termination of NYCSCA's lease of the site, AKRF was retained by the owner to conduct an investigation and cleanup. Mr. Jepsen helped to conduct groundwater sampling requirements set by the NYSDEC as part of the Brownfield Cleanup Agreement for the project site. Mr. Jepsen is supporting the ongoing operations and maintenance of an active sub-slab depressurization system installed beneath the building. Mr. Jepsen has also overseen in-situ chemical oxidation (ISCO) groundwater treatment injection activities performed on-site.

98-100 Franklin Street, Manhattan, NY

AKRF completed a Phase I Environmental Site Assessment (ESA), Phase II ESI, prepared a Remedial Action Work Plan, a NYCDEP Dewatering Application and Permit, and performed soil waste classification sampling (which required the preparation of a NYC Transit Subsurface Investigation Permit to perform the associated soil borings) for the proposed redevelopment for a 29,564-square foot, eight-story mixed-use building with a cellar. As the assistant project manager, Mr. Jepsen coordinated with the client and contactors and performed oversight of on-site remediation activities.

NYSDOT/NYSTA Tappan Zee Hudson River Crossing, Rockland and Westchester Counties, NY

AKRF completed an EIS for this project on a fast-track schedule. Findings of the study were utilized to develop numerous documents prepared to guide the construction team, including a Remedial Action Plan and a Construction Health and Safety Plan for the five-year bridge replacement project. As part of the findings of the study, additional mitigation was required to ensure safety of endangered species inhabiting the Hudson River. Mr. Jepsen has been responsible for captaining and assisting in vessel-based monitoring of endangered species within and surrounding the marine construction zone of the new Tappan Zee Bridge located in Tarrytown and Nyack, NY on the Hudson River.

Previous Experience

International-Matex Tank Terminals (IMTT) and ExxonMobil, Environmental Consulting Services, Bayonne, NJ

Mr. Jepsen was responsible for conducting operations and maintenance of an extensive groundwater monitoring well network at an active storage tank terminal located in Bayonne, NJ. Mr. Jepsen also conducted site investigation field activities; including soil, groundwater sampling, and monitoring well installation. Mr. Jepsen aided with the operation and maintenance of active remedial systems, including oil recovery skimming systems and water treatment and discharge systems. Mr. Jepsen was responsible for maintaining client relationships and acting as an on-site safety supervisor for all Bluestone employees and subcontractors. Mr. Jepsen assisted with relevant compliance reporting requirements, remedial work plans, and general work permitting

Various Gas Stations, Environmental Consulting Services, Various Locations, NJ

Mr. Jepsen conducted site investigation field activities, including groundwater sampling and monitoring well installation at various gas stations with open petroleum spills reported the NJDEP. Mr. Jepsen acted as an on-site safety supervisor for all Bluestone employees and subcontractors. Mr. Jepsen assisted with relevant compliance reporting requirements.

L.A.B. Validation Corp., 14 West Point Drive, East Northport, New York 11731

Lori A. Beyer

SUMMARY: General Manager/Laboratory Director with a solid technical background combined with Management experience in environmental testing industry. Outstanding organizational, leadership, communication and technical skills. Customer focused, quality oriented professional with consistently high marks in customer/employee satisfaction.

EXPERIENCE:

1998-Present L.A.B. Validation Corporation, 14 West Point Drive, East Northport, NY
President

- Perform Data Validation activities relating to laboratory generated Organic and Inorganic Environmental Data.

1998-Present American Analytical Laboratories, LLC. 56 Toledo Street, Farmingdale, NY
Laboratory Director/Technical Director

- Plan, direct and control the operation, development and implementation of programs for the entire laboratory in order to meet AAL's financial and operational performance standards.
- Ensures that all operations are in compliance with AAL's QA manual and other appropriate regulatory requirements.
- Actively maintains a safe and healthy working environmental that is demanded by local laws/regulations.
- Monitors and manages group's performance with respect to data quality, on time delivery, safety, analyst development/goal achievement and any other key performance indices.
- Reviews work for accuracy and completeness prior to release of results to customers.

1996-1998 Nytest Environmental, Inc. (NEI) Port Washington, New York
General Manager

- Responsible for controlling the operation of an 18,000 square foot facility to meet NEI's financial and operational performance standards.
- Management of 65 FTEs including Sales and Operations
- Ensure that all operations are in compliance with NEI's QA procedures
- Ensures that productivity indicators, staffing levels and other cost factors are held within established guidelines
- Maintains a quantified model of laboratory's capacity and uses this model as the basis for controlling the flow of work into and through the lab so as to ensure that customer requirements and lab's revenue and contribution targets are achieved.

1994-1996 Nytest Environmental, Inc. (NEI) Port Washington, New York
Technical Project Manager

- Responsible for the coordination and implementation of environmental testing programs requirements between NEI and their customers
- Supervise Customer Service Department
- Assist in the development of major proposals
- Complete management of all Federal and State Contracts and assigned commercial contracts
- Provide technical assistance to the customer, including data validation and interpretation
- Review and implement Project specific QAPP's.

1995-1996 Nytest Environmental, Inc. (NEI) Port Washington, New York
Corporate QA/QC Officer

- Responsible for the implementation of QA practices as required in the NJDEP and EPA Contracts
- Primary contact for NJDEP QA/QC issues including SOP preparation, review and approval
- Responsible for review, verification and adherence to the Contract requirements and NEI QA Plan

1992-1994 Nytest Environmental, Inc. (NEI) Port Washington, New York
Data Review Manager

- Responsible for the accurate compilation, review and delivery of analytical data to the company's customers. Directly and effectively supervised a department of 22 personnel.
- Managed activities of the data processing software including method development, form creation, and production
- Implement new protocol requirements for report and data management formats
- Maintained control of data storage/archival areas as EPA/CLP document control officer

1987-1991 Nytest Environmental, Inc. (NEI) Port Washington, New York
Data Review Specialist

- Responsible for the review of GC, GC/MS, Metals and Wet Chemistry data in accordance with regulatory requirements
- Proficient with USEPA, NYSDEC, NJDEP and NEESA requirements
- Review data generated in accordance with SW846, NYSDEC ASP, EPA/CLP and 40 CFR Methodologies

1986-1987 Nytest Environmental, Inc (NEI) Port Washington, New York
GC/MS VOA Analyst

EDUCATION:

1982-1985 State University of New York at Stony Brook, New York; BS Biology/Biochemistry
1981-1982 University of Delaware; Biology/Chemistry
5/91 Rutgers University; Mass Spectral Data Interpretation Course, GC/MS Training
8/92 Westchester Community College; Organic Data Validation Course
9/93 Westchester Community College; Inorganic Data Validation Course

Westchester Community College

Professional Development Center

Awards this Certificate of Achievement To

LORI BEYER

for Successfully Completing

ORGANIC DATA VALIDATION COURSE (35 HOURS)

Dr. John Samuelian

Date AUGUST 1992

Assistant Dean
Professional Development Center

President

The Professional
Development Center

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

Westchester Community College

Professional Development Center

Awards this Certificate of Achievement To

LORI BEYER

for Successfully Completing

INORGANIC DATA VALIDATION

Instructor: Dale Boshart

Date MARCH 1993

Assistant Dean
Professional Development Center

President

The Professional
Development Center

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

New York State Department of Environmental Conservation
50 Wolf Road, Albany, New York 12233

Thomas C. Jorling
Commissioner

July 8, 1992

Ms. Elaine Sall
Program Coordinator
Westchester Community College
Valhalla, NY 10595-1698

Dear Elaine,

Thank you for your letter of June 29, 1992. I have reviewed the course outline for organic data validation, qualifications for teachers and qualifications for students. The course that you propose to offer would be deemed equivalent to that which is offered by EPA. The individuals who successfully complete the course and pass the final written exam would be acceptable to perform the task of organic data validation for the Department of Environmental Conservation, Division of Hazardous Waste Remediation.

As we have discussed in our conversation of July 7, 1992, you will forward to me prior to the August course deadline, the differences between the EPA SOW/90 and the NYSDEC ASP 12/91. You stated these differences will be compiled by Mr. John Samulian.

I strongly encourage you to offer an inorganic data validation course. I anticipate the same list of candidates would be interested in an inorganic validation course as well, since most of the data to be validated consists of both organic and inorganic data.

Thank you for you efforts and please contact me if I can be of any further assistance.

Sincerely,

Maureen P. Serafini

Maureen P. Serafini
Environmental Chemist II
Division of Hazardous Waste
Remediation

The Professional
Development Center
AT
WESTCHESTER COMMUNITY COLLEGE

914 285-6619

October 2, 1992

Ms. Lori Beyer
3 sparkill Drive
East Northport, NY 11731

Dear Ms. Beyer:

Congratulations upon successful completion of the Organic Data Validation course held August 17 - 21, 1992, through Westchester Community College, Professional Development Center. This course has been deemed by New York State Department of Environmental Conservation as equivalent to EPA's Organic Data Validation Course.

Enclosed is your Certificate. Holders of this Certificate are deemed competent to perform organic data validation for the New York State DEC Division of Hazardous Waste Remediation.

The Professional Development Center at Westchester Community College plans to continue to offer courses and seminars which will be valuable to environmental engineers, chemists and related personnel. Current plans include a TCLP seminar on November 17th and a conference on Environmental Monitoring Regulations on November 18th.

We look forward to seeing you again soon at another environmental program or event. Again, congratulations.

Very truly yours,

Passing Grade is 70%
Your Grade is 99%

Elaine Sall
Program Coordinator

ES/bf

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

The Professional
Development Center
AT
WESTCHESTER COMMUNITY COLLEGE

914 285-6619

June 21, 1993

Dear Ms. Beyer:

Enclosed is your graded final examination in the Inorganic Data Validation course you completed this past March. A score of 70% was required in order to receive a certificate of satisfactory completion. Persons holding this certificate are deemed acceptable to perform Inorganic Data Validation for the New York State Department of Environmental Conservation, Division of Hazardous Waste Remediation.

I am also enclosing a course evaluation for you to complete if you have not already done so. The information you provide will greatly aid us in structuring further courses. We wish to make these course offerings as relevant, targeted and comprehensive as possible. Your evaluation is vital to that end.

Congratulations on your achievement. I look forward to seeing you again at another professional conference or course. We will be co-sponsoring an environmental monitoring conference on October 21, 1993 with the New York Water Pollution Control Association, Lower Hudson Chapter, at IBM's Yorktown Heights, NY site. Information regarding this event will be going out in August.

Very truly yours,

Elaine Sall

Elaine Sall
Program Coordinator

ES/bf

Enclosures

SUNY
WESTCHESTER COMMUNITY COLLEGE
Valhalla, New York 10595

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Personnel Resume

Melissa Haas
Project Manager II

Qualifications Summary

Ms. Haas has over 20 years of experience in the environmental laboratory industry which includes project management, inorganic chemistry department management, LIMS implementation, human resources, and data reporting. She has a proven ability to handle multiple projects and tasks and a passion for the highest achievable level of quality and customer service.

Professional Experience

Project Manager – TestAmerica - 2012 to Present

Ms. Haas coordinates and manages clients' projects through all phases of the laboratory operations, ensuring fulfillment of TestAmerica's commitments to client requirements and on-time delivery. She maintains communications with clients and account executives and serves as a liaison between clients and laboratory operations to meet clients' needs. She reviews contractual documents and Quality Assurance Project Plans (QAPPs) to ensure certification and laboratory analytical requirements. Ms. Haas assists clients in identifying project requirements and manages project setup on behalf of the laboratory. She also develops business relationships with clients to further enhance client service and sales. She ensures accuracy and on-time delivery of client reports.

Laboratory Information Management (LIMS) Implementor – TestAmerica − 2011 to 2012

Ms. Haas was responsible for method and reference data setup for laboratories that were scheduled to implement the TALS LIMs system. She communicated with laboratory personnel to acquire information about standard operating procedures to ensure that methods and reference data were set up to meet the needs of the laboratory. She also provided on-site support for laboratories during the Go-Live period of the implementation and was the primary lead for the newly developed Certification Module. She trained laboratory and corporate personnel on the specifications of the software. She also provided remote data review assistance for laboratories to aid in the validation of the methods and reference data setup as well as the accuracy of the analysts' review process.

Metals Department Manager – TestAmerica – 2009-2011

Ms. Haas managed the operational activities of the metals department, including managing staff through clearly setting goals and providing performance reviews and feedback. She monitored the daily laboratory workload and ensured resources and staff were in place to complete projects on time. She prepared inorganic chemistry data packages and reviewed data for accuracy while prioritizing work to ensured timely delivery of quality data packages to clients. She oversaw the quality control of the department including demonstration of capabilities, method detection limit studies, SOP updates, audit responses, and performance evaluation responses.

Human Resources Coordinator – TestAmerica – 2007-2009

Ms. Haas provided support to the laboratory and Corporate Human Resources by implementing and administering Human Resources programs and procedures. She advised managers on Human Resources-related issues and managed the interview process for laboratory hires. She also served as a resource to the lab employees with HR-related issues and coordinated employee recognition programs and special events to promote employee satisfaction.

Wet Chemistry Department Manager – TestAmerica – 2001-2007

Ms. Haas managed the operational activities of the wet chemistry department and supervised a staff of eight analysts. She was responsible for data review, training, and quality control for the department. She increased productivity levels by providing key contributions toward automation of laboratory.

Wet Chemistry Analyst – Severn Trent Labs/AEN – 1997-2001

Veterinary Technician− Mobile Veterinary Clinic − 1994-1997

Campus Organizer –NJ Public Interest Research Group − 1990-1993

Education

- Rutgers University, New Brunswick, NJ 1986-1990, Bachelor of Science, Animal Science

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Personnel Resume

Carl Armbruster
QA Manager

Qualifications Summary

Mr. Armbruster has over 30 years of experience in the environmental laboratory and engineering industry that includes extensive technical, management/leadership experience in all aspects of the laboratory business. He is an action-oriented manager dedicated to ensuring the laboratory maintains a quality program that holds the highest credentials in PT scores, accreditations and customer satisfaction. His unique experience lends itself to working successfully with employees, managers and clients at all levels.

Professional Experience

Quality Assurance Manager – TestAmerica Edison - 2005 to Present

Mr. Armbruster is responsible for establishing and implementing the quality assurance program at the Edison facility; and for interfacing with the corporate Quality Assurance Director to ensure adherence with the overall Quality Management Plan. He is also responsible for monitoring implementation and compliance with NELAC and TestAmerica's QMP, conducting annual management system audits and data audits, as well as providing regulatory updates and technical support to the Laboratory Director, Operations Manager, Client Services and Sales department.

Project Manager/Assistant Technical Director – STL Edison --2000 to 2005

Laboratory Director − STL Whippany − 1998 to 2000

Account Manager − Clean Harbors Environmental Services − 1997 to 1998

Laboratory Manager − Waste Management Inc., and Chemical Waste Management Inc − 1988 to 1997

Environmental Scientist − ICF Technology − 1987 to 1988

Analytical Chemist − IT Corporation – 1985 to 1987

Analytical Chemist − Hess Environmental Laboratories – 1983 to 1985

Education

- MS in Biology – East Stroudsburg University, 1984
- BS in Environmental Studies - East Stroudsburg University, 1980

APPENDIX F
GROUNDWATER MONITORING WELL SAMPLING LOG FORM

Well Sampling Log

Job No: 11259		**Client:**	**Well No:**
Project Location: 34 Berry Street, Brooklyn, NY		**Sampled By:**	
Date:		**Sampling Time:**	
LEL at surface:			
PID at surface:			
Total Depth:	ft. below top of casing	**Water Column (WC):** feet	*= 0.163 * WC for 2" wells
Depth to Water:	ft. below top of casing	**Well Volume*:** gallons	*= 0.653 * WC for 4" wells
Depth to Product:	ft. below top of casing	**Volume Purged:** gallons	*= 1.469 * WC for 6" wells
Depth to top of screen:	ft. below top of casing	**Well Diam.:** inches	Target maximum flow rate is 100 ml/min
Depth to bottom of screen:	ft. below top of casing	**Purging Device (pump type):**	
Approx. Pump Intake:	ft. below top of casing		

Time	**Depth to Water** (Ft.)	**Purge Rate** (ml/min)	**Temp** (^{o}C)	**Conductivity** (mS/cm)	**DO** (mg/L)	**pH**	**ORP** (mV)	**Turbidity** (NTU)	**Comments** (problems, odor, sheen)
Stabilization Criteria:				**+/- 3 mS/cm**	**+/- 0.3 mg/L**	**+/- 0.1 pH units**	**+/- 10 mV**	**<50 NTU**	If water quality parameters do not stabilize and/or turbidity is greater than 50 NTU within two hours, discontinue purging and collect sample.

Groundwater samples analyzed for:

APPENDIX G
SUB-SLAB SOIL VAPOR SAMPLING LOG AND INDOOR AIR SAMPLING LOG FORMS

Sub-Slab Soil Vapor Sample Log

AKRF Project No:	11259		**Point Installed By:**	ADT, Inc.	
Project Location:	34 Berry Street, Brooklyn, NY		**Installation Method:**	Permanent sub-slab soil vapor point installation with core drill in 2021	
Client:			**Sampled By:**		
Date:			**Weather:**		
Sample Setup					
Vapor Point Depth:	~12	Inches	**Total Time of Purge:**		
Purging Pump:	Gilair Plus (or equal)		**Purge Volume:**		
Pump Flow Rate*:	0.2	L/min	**Purged Vapor PID:**		ppm
Sample Identification					
Soil Vapor Point ID:			**SUMMA® Canister ID:**		
Flow Controller ID:			**Soil Vapor Sample ID:**		

Sample Collection

Time		Vacuum (in/Hg)	Background PID	Notes
Time Started:				
Time Halfway:				
Time Stopped:				

Notes:

*Purge flow rate not to exceed 0.2 L/min.

ND = non-detect ppm = parts per million L/min = Liters per minute

Sub-slab soil vapor sample "_____" was collected in a __-L SUMMA® canister using a ___-hour flow controller.

Ambient Air Sample Log

AKRF Project No:	11259	**Client:**	
Project Location:	34 Berry Street, Brooklyn, NY	**Sampled By:**	
Date:		**Weather:**	

Sample Setup

Sample Identification

On-Site Location:		**SUMMA® Canister ID:**	
Flow Controller ID:		**Ambient Air Sample ID:**	

Sample Collection

Time		Vacuum (in/Hg)	Background PID	Potential VOC Sources/Notes
Time Started:				
Time:				
Time Halfway:				
Time:				
Time Stopped:				

Notes:	ND = non-detect	ppm = parts per million	L/min = Liters per minute
	Ambient air sample _____ collected in a __-L SUMMA® canister using a ___-hour flow controller.		

Indoor Air Sample Log

AKRF Project No:	11259	**Client:**	
Project Location:	34 Berry Street, Brooklyn, NY	**Sampled By:**	
Date:			

Sample Setup

Sample Identification

On-Site Location:		**SUMMA® Canister ID:**	
Flow Controller ID:		**Ambient Air Sample ID:**	

Sample Collection

Time		Vacuum (in/Hg)	Background PID	Potential VOC Sources/Notes
Time Started:				
Time:				
Time Halfway:				
Time:				
Time Stopped:				

Notes:	ND = non-detect	ppm = parts per million	L/min = Liters per minute
	Indoor air sample _____ collected in a 6-L SUMMA® canister using a ___-hour flow controller.		

APPENDIX H
SITE-WIDE INSPECTION FORM

Annual Site-Wide Inspection

Overview of Annual Site-Wide Inspection requirements:

1) General Site conditions at time of inspection;

2) Site Cover System Inspection;

3) Any Site activities currently being conducted (including active Engineering Controls);

4) Last SMP-related Site Activity conducted, upcoming SMP-related tasks;

5) Institutional Control (IC) Checklist (SMP, EWP maintained on-Site, routine SMP tasks being conducted);

6) Evaluation of Engineering Controls (in office); and

7) Site Documentation.

---

1) General Site conditions at time of inspection:

NAME:	**DATE:**
TIME:	**WEATHER:**
Annual Inspection or Emergency Inspection (if emergency, specify nature)?	

Notes:_____

_____

_____

_____

2) Cover System Inspection (Entire Site Building, Exterior Courtyard and Parking Areas)

Is the Site Cover System intact?	☐ YES	☐ NO
If no, describe:		
Are all access manhole covers in good condition? (monitoring/injection/extraction wells and sub-slab soil gas points)	☐ YES	☐ NO
If no, list location and corrective action:		

Observation Notes Regarding Cover System Conditions (including Basement and Outdoor Cover System types):

_____

_____

_____

Have any disturbances to the Site cover system occurred over the last reporting period?
☐ YES ☐ NO

Notes/Details:

_____

_____

_____

_____

_____

3) Are any SMP-related site activities currently being conducted (including active groundwater treatment system operation, passive SSDS operation)?

☐ YES ☐ NO

Notes/Details:

_____

_____

_____

_____

_____

4) Last SMP-related Site Activity conducted; and next SMP-related task Scheduled?

Notes/Details:

_____

_____

_____

_____

_____

5) IC Checklist (SMP, EWP maintained on-Site, routine SMP tasks being conducted)

Copy of SMP on-Site?	☐ YES ☐ NO
Copy of EWP on-Site?	☐ YES ☐ NO
Building Use Still Consistent with SMP (Restricted Residential)?	☐ YES ☐ NO

Have the required SMP tasks been conducted during the reporting period?

Routine groundwater treatment system inspections/monitoring ☐ YES ☐ NO

Remote groundwater treatment system status monitoring ☐ YES ☐ NO

Quarterly groundwater monitoring well gauging ☐ YES ☐ NO

Quarterly groundwater monitoring/sampling ☐ YES ☐ NO

Quarterly sub-slab soil vapor screening ☐ YES ☐ NO

(PID & pressure/vacuum)

Annual passive SSDS monitoring ☐ YES ☐ NO

Annual Site cover system inspection ☐ YES ☐ NO

Notes:_____

_____

_____

_____

_____

6) Evaluation of ECs

Environmental Control Type: Groundwater Treatment System	
Is the groundwater treatment system currently operating? If no, describe reason/alarm condition(s):	☐ YES ☐ NO
Are the various gauges and components of the treatment system and the digital control panel clean?	☐ YES ☐ NO
Are the injection and extraction well access manifolds in good/working condition? If no, describe plans for repair:	☐ YES ☐ NO
Have any problems occurred that require corrective action to the treatment system components or well access manifolds? If yes, describe:	☐ YES ☐ NO
Any evidence of treatment system tampering, vandalism or damage in the basement? If yes, describe:	☐ YES ☐ NO
Was a groundwater treatment system inspection log completed?	☐ YES ☐ NO
If no, describe reason/If yes, attach completed inspection log to the site inspection log:	

Groundwater treatment system operations have also been documented using the applicable inspections logs (see attached) that will be provided as part of the PRR.

Notes:_____

_____

_____

Environmental Control Type: Passive SSDS	
Are there any unusual odors, spills or leaks near the SSDS piping in the basement or the parking garage stairway enclosure? If yes, describe source and plans for repair:	☐ YES ☐ NO
Are the above grade components of the SSDS clean?	☐ YES ☐ NO
Any evidence of SSDS piping tampering, vandalism or damage in the basement or the parking garage stairway enclosure? If yes, describe:	☐ YES ☐ NO
Any evidence of SSDS piping tampering, vandalism or damage on the SSDS piping in the basement or the parking garage stairway enclosure? If yes, describe:	☐ YES ☐ NO

Notes:_____

_____

_____

_____

_____

7) Site documentation

Including updates regarding notification to NYSDEC regarding any changes to Site conditions/operations, routine reporting to NYSDEC, etc.).

Notes:_____

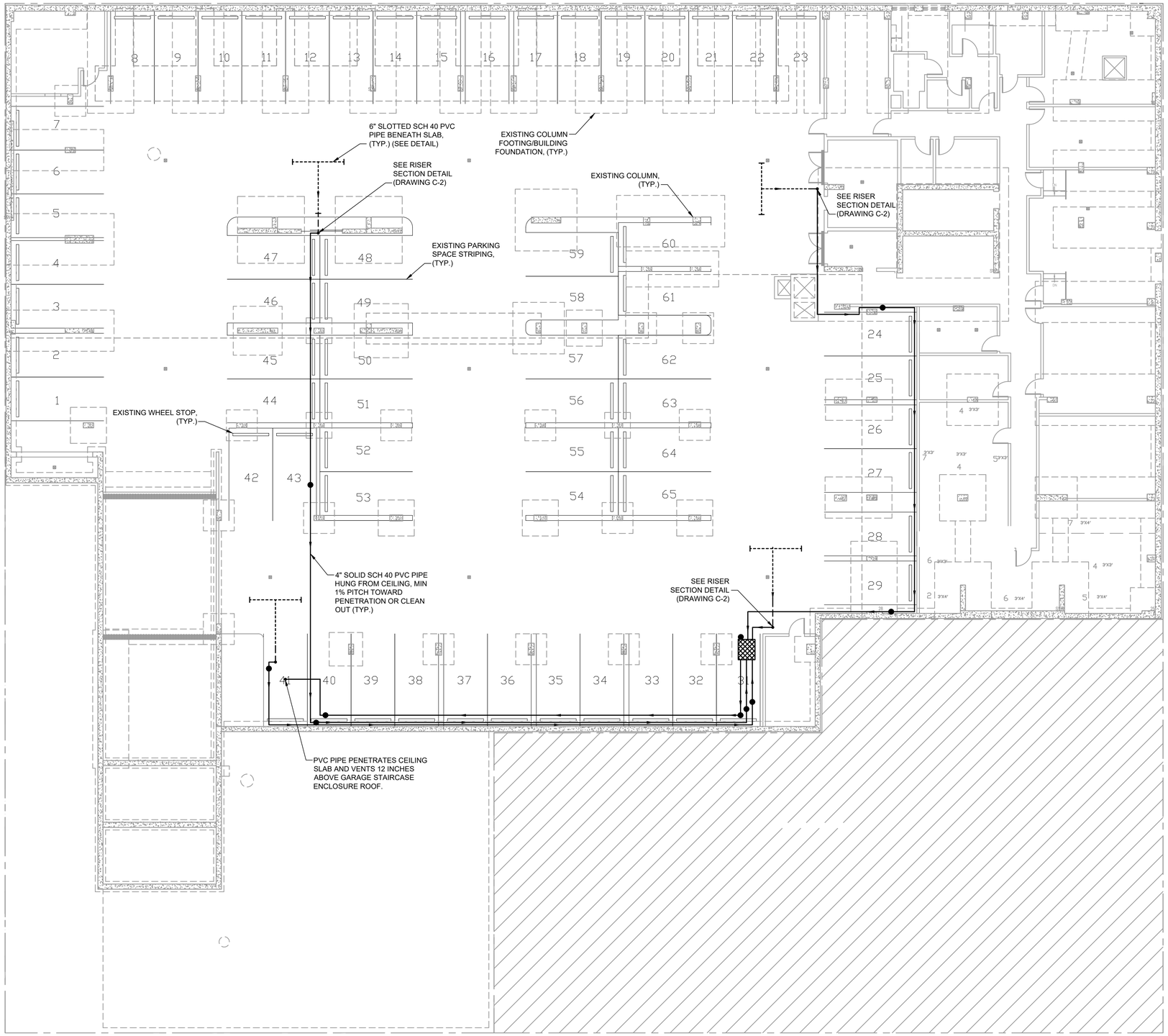
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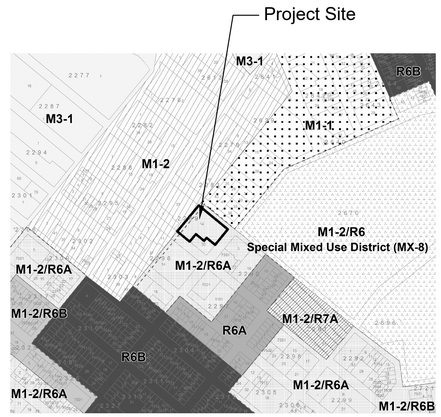
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APPENDIX I
SSDS AS-BUILT DRAWINGS





ZONING MAP

NOTE:
M1-2 = Light/Medium Manufacturing
R6A = General Residence

LEGEND

- EXISTING CONC. COLUMN
- EXISTING COLUMN FOOTING/FOUNDATION WALL
- EXISTING BUILDING WALL
- EXISTING PARKING STRIPING
- 6" PERFORATED SCH. 40 PVC PIPE BELOW FLOOR SLAB
- 4" SOLID CAST IRON PIPE BELOW FLOOR SLAB
- 4" SOLID SCH. 40 PVC PIPE HUNG FROM CEILING OR WALL
- CLEAN OUT

0 5 10 20

SOURCE:
BASED ON DRAWINGS A-100 (CELLAR FLOOR CONSTRUCTION PLAN)
AND FS-100 (FOUNDATION PLAN) FROM PROJECT CONSTRUCTION SET
Prepared by YSRAEL A. SEINUK, P.C. CONSULTING ENGINEERS
228 EAST 45th ST, 2nd FLOOR
NEW YORK, NY 10017

OWNER/APPLICANT

LCOR INCORPORATED
ONE PENN PLAZA
SUITE 3310
NEW YORK, NY 10119
212-760-0060 (PHONE)
212-760-0891 (FAX)

ENVIRONMENTAL ENGINEER

AKRF, INC.
440 PARK AVENUE SOUTH
NEW YORK, NY 10016
212-696-0670 (PHONE)
212-726-0942 (FAX)

MEP ENGINEER

MG ENGINEERING, P.C.
116 WEST 32ND STREET
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MICHELLE LAPIN, P.E.

REVISIONS

No.	DATE	DESCRIPTION
1	4/9/2010	AS-BUILT

PROJECT
34 BERRY STREET - SUB-SLAB DEPRESSURIZATION SYSTEM RETROFIT

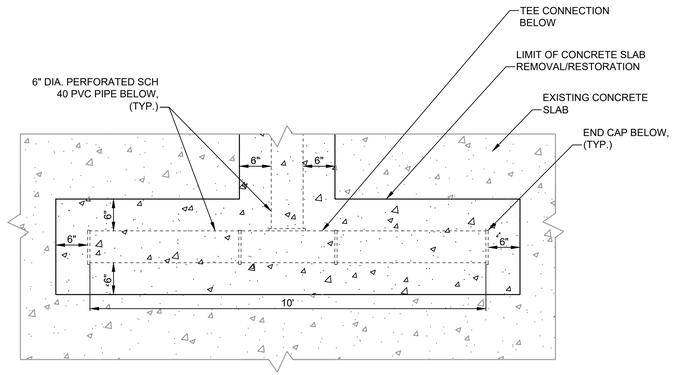
DRAWN BY	CHECKED BY
JRS	ML
SCALE: AS SHOWN	DATE: 02/26/10

SHEET TITLE
PASSIVE SSDS LAYOUT

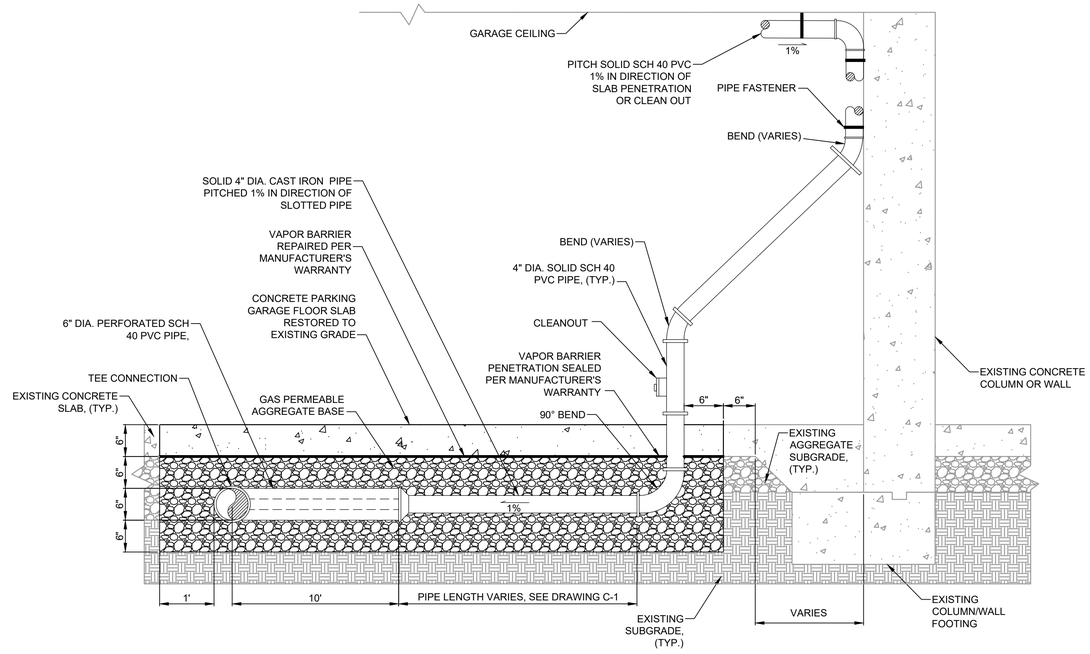
SHEET NO.
C-1

SHEET 1 OF 2

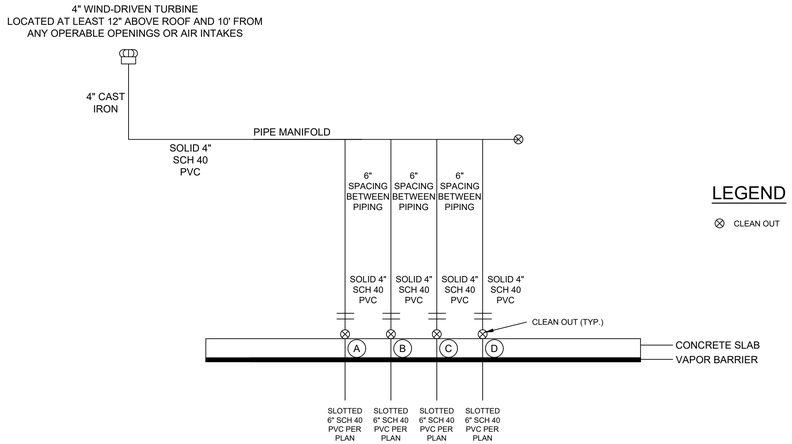
©2022 AKRF Inc M:\AKRF Projects\11259 - 34 Berry St LCOR\IB\CP\CAD\2019_04_07_SSDS_plotall.dwg ibal kevin.rhinehart 07/18/2023 1:18 PM



TEE PLAN VIEW
N.T.S.



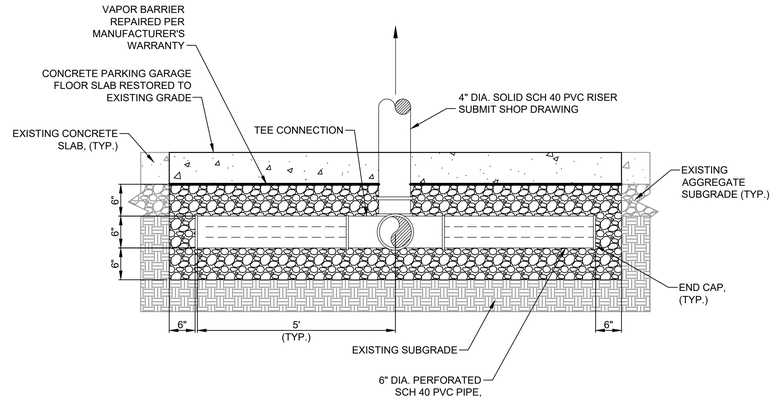
RISER SECTION DETAIL
N.T.S.



LEGEND

⊗ CLEAN OUT

VENTING SYSTEM FLOW DIAGRAM
N.T.S.



TEE SECTION DETAIL
N.T.S.

OWNER/APPLICANT

LCOR INCORPORATED
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STATE OF NEW YORK · MICHELLE LAPIN · LICENSED PROFESSIONAL ENGINEER

MICHELLE LAPIN, P.E.

REVISIONS

No.	DATE	DESCRIPTION
1	4/9/2010	AS-BUILT

PROJECT
34 BERRY STREET - SUB-SLAB DEPRESSURIZATION SYSTEM RETROFIT

DRAWN BY	CHECKED BY
JRS	ML
SCALE	DATE
N.T.S.	02/26/10

SHEET TITLE
PASSIVE SSDS DETAILS

SHEET NO.
C-2

SHEET 2 OF 2

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APPENDIX J
GROUNDWATER TREATMENT SYSTEM COMPONENT SPECIFICATIONS AND MANUALS

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name: TASK™ Anionic Surfactant Blend

Synonyms: TASK™

Product Form: Mixture

Recommended use of the chemical and restrictions on use

Recommended Use: Professional use, Industrial use. Surfactant, Remediation of Groundwater and Soil.
Restrictions on Use: Use as recommended by the label.

Details of the supplier and of the safety data sheet

Supplier
Tersus Environmental, LLC
1116 Colonial Club Rd
Wake Forest, NC 27587
Phone: +1-919-453-5577
Email: info@tersusenv.com

Contact Person
David F. Alden
Phone: +1-919-453-5577 x2002
Email: david.alden@tersusenv.com

Emergency telephone number

For leak, fire, spill or accident emergencies, call:

+1-919-453-5577 (Tersus Office Hours, 8:00 AM to 5:00 PM Eastern)
+1-800-424-9300 (Chemtrec 24 Hour Service – Emergency Only)
+1-919-638-7892 Gary M. Birk (Outside office hours)

2. HAZARD IDENTIFICATION

GHS classification
Acute Tox. 4 Oral, Eye Dam. 1, Flam. Liq. 3, Skin Irrit. 2, Skin Sens. 1

Label element

Hazard pictograms:



Signal word Danger

Hazard statement(s):

Flammable liquid, Category 3	H226 - Flammable liquid and vapor.
Acute toxicity, Category 4 Oral	H302 - Harmful if swallowed.
Skin irritation, Category 2	H315 - Causes skin irritation.
Skin sensitizer, Category 1	H317 - May cause an allergic skin reaction.
Serious Eye Damage, Category 1	H318 - Causes serious eye damage

Precautionary statement:

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 - Keep container tightly closed.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical/ventilating/lighting/equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static.
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 - Wash hands, forearms, and face thoroughly after handling.
P270 - Do not eat, drink, or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P301+P312 - IF SWALLOWED: Call a POISON CENTER/doctor/physician if you feel unwell.
P302+P352 IF ON SKIN: Wash with plenty of water
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+351+338 - IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
P310 - Immediately call POISON CENTER or doctor/physician.
P312 - Call a POISON CENTER/doctor/physician if you feel unwell.
P321 - Specific treatment (see first aid section on this label).
P330 - Rinse mouth.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P362+P364 - Take off contaminated clothing and wash it before reuse.
P370+P378 - In case of fire: Use appropriate method to extinguish.
P391 - Collect spillage.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P403+P235 - Store in a well-ventilated place. Keep cool.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with national regulations.

Hazard(s) not otherwise classified (HNOC):

None

Supplemental information:

None

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Formula Mixture

Hazardous components

Chemical Name	CAS Number	Concentration (%)	GHS Symbols	GHS Statements
Butanedioic acid, sulfo-, 1,4-bis(2-ethylhexyl) ester, sodium salt		25-50	GHS07	H302-315-320
2-propanol	67-63-0	10-25	GHS02-GHS07	H225-319-336
Benzenesulfonic Acid Mixture	65143-89-7	10-25	GHS05-GHS07	H227-317-318

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

Synonyms are provided in Section 1.
Occupational exposure limits, if available, are listed in Section 8.

4. FIRST AID MEASURES

General Information	Check the vital functions. If unconscious place in recovery position and seek medical advice. In case of respiratory arrest, administer artificial respiration. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Take victim to a doctor if irritation persists. Remove affected person from source of contamination.
Eye Contact	Immediately flush eyes with water. Flush eyes with water for a minimum of 15 minutes, occasionally lifting and lowering upper lids. Get medical attention promptly. Remove contact lenses if worn.
Skin Contact	Remove contaminated clothing. Wash skin with soap and water. Get medical attention. Wash clothing separately and clean shoes before reuse.
Inhalation	Rescuers should put on appropriate protective gear. Remove from area of exposure. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Keep victim warm. Get immediate medical attention.
Ingestion	Rescuers should put on appropriate protective gear. Remove from area of exposure. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Keep victim warm. Get immediate medical attention.
Most important symptoms and effects, both acute and delayed	Symptoms/injuries after skin contact: Causes skin irritation. Symptoms/injuries after eye contact: Eye damage / irritation.
Indication of any immediate medical attention and special treatment needed	If exposed or concerned, get medical advice and attention.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Use water (fog only), dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable Extinguishing Media	Do not use water stream, as this may spread fire.
Specific Hazards Arising from the Chemical or Mixture	Thermal decomposition can lead to releases of irritating gases and vapors.
Special Fire Fighting Procedures	Use typical firefighting equipment, special tightly sealed suits. Wear self-contained breathing apparatus for firefighting if necessary. Do not inhale explosion and/or combustion gases.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures	Stop or contain leak at the source, if safe to do so. Ventilate area of leak or spill. Keep upwind of spill. Wear protective clothing as described in Section 8 of this safety data sheet. Do not smoke or use open fire or other sources of ignition. Contact with walking surface may result in formation of slippery film/falling hazard. Keep unnecessary personnel from entering the area.
Environmental Precautions	Should not be released into the environment. Do not discharge into drains, sewers, or watercourses or onto the ground. Inform the relevant authorities if this occurs.
Methods for Containment and Clean Up	Wipe up with absorbent material (e.g., cloth, fleece). Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling	Do not get in eyes or on skin or clothing. See Section 8, Exposure Control / Personal Protection. Do not breath mist or vapor. Use with adequate ventilation. Remove contaminated clothing and wash before use.
Hygiene measures	Do not eat, drink, or smoke when working. Wash hands before breaks and after work.
Conditions for safe storage, including any incompatibilities	Storage in a cool, well-ventilated area. Protect from freezing and physical damage. Keep in properly labelled tightly sealed containers.

8. EXPOSRE CONTROL / PERSONAL PROTECTION

Control parameters

Name	STD	TWA – 8 Hrs		STEL – 15 Min		Notes
Isopropyl alcohol (IPA)	WEL	400 ppm	999 mg/m3	500 ppm	1250 mg/m3	

WEL = Workplace Exposure Limit.

DNEL

Industry	Dermal	888	mg/kg/day
Industry	Inhalation.	500	mg/m3
Consumer	Dermal	319	mg/kg/day
Consumer	Inhalation.	89	mg/m3
Consumer	Oral	26	mg/kg/day

PNEC

Freshwater	140.9	mg/l
Marine water	140.9	mg/l
Sediment	552	mg/kg
Soil	28	mg/kg

Name	STD	TWA – 8 Hrs.		Notes
Propylene glycol	WEL	150 ppm total vapor and particulates	10 mg/m3 particulates 474 mg/m3 total vapor and particulates	Propane-1,2-diol

Diethylhexyl sodium sulfosuccinate

DNEL

Industry	Dermal	Long Term	Systemic Effects	31.3 mg/kg/day
Industry	Inhalation.	Long Term	Systemic Effects	44.1 mg/m3
Consumer	Dermal	Long Term	Systemic Effects	18.8 mg/kg/day
Consumer	Inhalation.	Long Term	Systemic Effects	13 mg/m3
Consumer	Oral	Long Term	Systemic Effects	18.8 mg/kg/day

PNEC

Freshwater	Long Term	0.0066	mg/l
Marinewater	Long Term	0.00066	mg/l
Sediment marine	Long Term	0.0653	mg/kg dwt
Soil	Long Term	0.138	mg/kg dwt
Sewage Treatment		122	mg/l

Safe Handling: See Section 7
Additional Information To date, no national critical limit values exist.

Exposure Control

Protective equipment



Appropriate engineering controls	Provide adequate general and local exhaust ventilation. Observe any occupational exposure limits for the product or ingredients. Do not allow uncontrolled discharge of product into the environment.
Eye/face protection	The following protection should be worn: Chemical splash goggles.
Hand protection	Neoprene. Rubber (natural, latex), Butyl rubber. Wear protective gloves made of the following material: Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. Polyvinyl chloride (PVC). Manufactured/tested in accordance with EN 374, Avoid the following conditions: Polyvinyl alcohol (PVA).
Other skin and body protection	Wear appropriate clothing to prevent any possibility of skin contact.
Hygiene measures	Wash promptly if skin becomes contaminated. Wash hands at the end of each work shift and before eating, smoking, and using the toilet. When using do not eat, drink, or smoke.
Respiratory protection	If ventilation is inadequate, suitable respiratory protection must be worn. Wear a respirator fitted with the following cartridge: Particulate filter, type P2.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Color	Water white to light amber
Appearance	Clear & Free of Matter
Odor	Alcohol odor
Odor threshold	Specific data not available
pH	(10% in water): 6.0-10.5 @ 25 °C
Melting point (°C)	Specific data not available
Boiling point (°C)	100°C (212°F)
Flash Point	31°C (closed cup)
Evaporation rate	Specific data not available
Specific gravity (water = 1)	1.0349 – 1.0664
Water solubility (%)	>10 Organic solvents miscible with water
Viscosity	500cSt at 40°C (104°F)

10. STABILITY AND REACTIVITY

Reactivity	No dangerous reaction known under conditions of normal use.
Chemical stability	Stable under normal conditions and use.
Possibility of hazardous reactions	No dangerous reactions known.
Conditions to avoid	No further relevant information available.
Incompatible materials	Strong oxidizing agents. Strong acids. Peroxides and other radical forming substances.
Hazardous decomposition products	Carbon monoxide, carbon dioxide.
Hazardous Polymerization	Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Acute toxicity (oral)	LD50 Species: Rat (male/female) Dose: >2.000 mg/kg Method: OECD 423
Skin	Acute toxicity estimate: 3,571 mg/kg Method: Calculation method
Serious Eye Damage/Irritation	Not classified
Respiratory or Skin Sensitization	Not classified
Ingestion	Not classified
Germ Cell Mutagenicity	Not classified
Carcinogenicity	Not classified
Reproductive Toxicity	Not classified
Specific Target Organ Toxicity – Single Exposure	Not classified
Specific Organ Toxicity – Repeated Exposure	Not classified
Aspiration Hazard	Not classified
General Remarks	Not classified

Additional Toxicological Information
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us. The substance is not subject to classification.

Carcinogenic Categories

IRAC (International Agency for Research on Cancer): No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH (American Conference of Governmental Industrial Hygienists): No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible, or confirmed human carcinogen by ACGIH.

NTP (National Toxicology Program): No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.

OSHA (Occupational Safety & Health Administration): No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

12. ECOLOGICAL INFORMATION

The data below is for individual components. There is no ecological information available for the final product mixture.

Component	Freshwater Algae	Freshwater	Fish Microtox	Water Flea
Benzenesulfonic acid, hexadecyl(sulfophenoxy)-, disodium salt	EC50 = 42 mg/L 72 h EC50 = 100 mg/L 72 h	LC50 = 0.42 mg/L 96 h LC50 = 0.86 mg/L 96 h	-	EC50 = 6.95 mg/L 48 h
Sodium sulfate	-	-	-	EC50 = 2564 mg/L 48 h EC50 = 4547 mg/L 96 h

Sodium Dioctyl Sulfosuccinates

Algae Test Results

Test: Growth Inhibition (OECD 201)
Duration: 0-72 hr
Species: Green Algae (Selenastrum capricornutum)
118 mg/L EbC50

Test: Growth Inhibition (OECD 201)
Duration: 24-72 hr
Species: Green Algae (Selenastrum capricornutum)
272 mg/L ErC50

Fish Test Results

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr
Species: Bluegill Sunfish (Lepomis macrochirus)
54.5 mg/L LC50

Test: Acute toxicity, freshwater (OECD 203)
Duration: 96 hr
Species: Rainbow Trout (Oncorhyncus mykiss)

35.4 mg/L LC50

Invertebrate Test Results

Test: Acute Immobilization (OECD 202)
Duration: 48 hr
Species: Water Flea (Daphnia magna)
35.9 mg/L EC50
DEGRADATION

Test: Closed Bottle (OECD 301D)
Duration: 29-day Procedure: Ready biodegradability
39.5 %
Test: DOC Die-away (OECD 301A)
Duration: 28-day Procedure: Ready biodegradability
95 %

Degradation

Test: Closed Bottle (OECD 301D)
Duration: 29-day Procedure: Ready biodegradability 39.5 %

Test: DOC Die-away (OECD 301A)
Duration: 28-day Procedure: Ready biodegradability 95 %

Ecotoxicity effects: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Chemical Fate Information
Product is readily biodegradable in wastewater treatment systems.

Biodegradability
Slow, not readily degradable Method: OECD 301 D
Chemical Oxygen Demand: 2.324 mg/g DIN 38409 T.31

Bioaccumulative potential
No data available

Aquatoxicity, invertebrates
Species: Daphnia magna
Exposure duration: 48 h
EC50: > 100 mg/l
Method: OECD 202

Aquatoxicity, algae / aquatic plants
Species: Scenedesmus subspicatus
Exposure duration: 72 h
EbC50: 341 mg/l
Method: OECD 201

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods Dispose according to federal, state, and local laws. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Authority. Waste is suitable for incineration.

14. TRANSPORTATION INFORMATION

U.S. (D.O.T.)

Proper Shipping Name: Flammable liquids, n.o.s. (Isopropanol, mono-and-dihexadecyl disulfonated diphenyl oxide)
Hazard Class: 3
UN/NA: UN1993
Packing Group: II
Labels:



15. REGULATORY INFORMATION

Federal EPA

SARA Title III:

Section 302/304 Extremely Hazardous Substances: None
Section 311 Hazardous Categorization:
Acute√ Chronic√ Fire√ Pressure Reactive N/A
Section 313 Toxic Chemicals: None

CERCLA Hazardous Substances: None
Volatile Organic Compounds: Isopropanol, 1,2-Propylene glycol
TSCA Status: All chemicals in this product are on the TSCA Chemical Substances Inventory.

State Right-to-Know

New Jersey: Subject to the New Jersey labeling requirements on package and bulk storage tanks.

International Regulations

Global Status: AICS, Australia; Canadian DSL & NDSL; PICCS, Philippines listed.

EU-Regulation
Contains no REACH substances with Annex XVII restrictions
Contains no substance on the REACH candidate list.
Contains no REACH Annex XIV substances

Other information, restriction, and prohibition: according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EC) No. 453/2010. Labelling according to Regulation (EC) No. 1272/2008 [CLP]. This product may impact SEVESO storage regulations. Dangerous Substances Directive 67/548/EEC.

Guidance: Workplace Exposure Limits EH40. CHIP for everyone HSG228. Safety Data Sheets for Substances and Preparations. Approved Classification and Labeling Guide (Sixth Edition) L13

National Regulations
The Chemicals (Hazard Information and Packaging for Supply) Regulations 2009 (SI 2009 No. 716).
Control of Substances Hazardous to Health Regulations 2002 (as amended).
Water hazard class (WGK): 2 – hazard to waters
Regulatory reference: To date, no national critical limit values exist.

16. OTHER INFORMATION

Abbreviations:
DNEL Derived No-Effect Level
PEL Permissible Exposure Limit
PNEC Predicted No Effect Concentration
TWA Time-Weighted Average
WEL Workplace Exposure Limit.

Disclaimer: The information contained in this Safety Data Sheet (SDS), as of the issue date, is believed to be true and correct. However, the accuracy or completeness of this information and any recommendations or suggestions are made without warranty, express or implied, or guarantee. Tersus Environmental, LLC urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. Since we cannot control the application, use or processing of the product, we do not accept responsibility. Therefore, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product and assure that the intended use of the product will not infringe in any party's intellectual property right. The information presented here pertains only to the product as shipped.

All recommendations for the use of our products, whether given by us, orally or to be implied from data or lab tests results by us, are based on the current state of our knowledge at the time those recommendations are made. When additional information is obtained, these recommendations may be updated. They may also be influenced by circumstances outside our control. Notwithstanding, such recommendation the user is responsible that the product as supplied by us is suitable to the process or purpose he/she intends to use it.

Due to the proliferation of sources for information such as manufacturer specific SDSs, we are not and cannot be responsible for SDSs obtained from any source other than ourselves. If you have obtained an SDS from another source or if you are not sure that the SDS you have is current, please contact us for the most current version.

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End of Safety Data Sheet

Diluted TASK® Surfactant SDS

1. Product and Company Identification

Trade Name (As Labeled):	**Diluted TASK™**
Synonyms:	None
CAS#:	Mixture
Product Use:	This product is used for soil and ground water remediation
Restrictions on Use:	None
Supplier:	Terus Environmental, LLC 1116 Colonial Club Rd Wake Forest, NC 27587 Phone: +1 (919) 453-5577 info@tersusenv.com – www.tersusenv.com
Contact Person:	David Alden Phone: +1 (919) 453-5577 x2002 • david.alden@tersusenv.com
Emergency Number:	+1 (919) 453-5577 ext. 2001
Date of Current Revision:	November 21, 2018
Date of Last Revision:	

2. Hazard Identification



CLASSIFICATION
UN – 3082. Class 9; Packing Group III, *Marine Pollution: P.* Reportable Quantity (RQ): *not component is listed*

EMERGENCY OVERVIEW: WARNING
If ingested, may cause diarrhea.

PRIMARY ROUTES OF EXPOSURE: EYE CONTACT, SKIN ABSORPTION AND CONTACT, INGESTION, INHALATION

POTENTIAL HEALTH EFFECTS:
***Eyes*:** May cause mild irritation and redness of the eye.
***Skin*:** May cause slight irritation.
***Ingestion*:** May cause abdominal discomfort and diarrhea.
***Inhalation*:**

CHRONIC INFORMATION:
Non-carcinogenic. Excessive exposure may cause liver and kidney problems.

3. Composition and Information on Ingredients

Anionic Surfactant Mixture, <1%

Trace amounts of Isopropanol and propylene glycol, < 0.05%

4. First Aid Measures

EYE CONTACT: Flush eyes thoroughly with water for 30 minutes. Consult a physician, preferably an ophthalmologist.
SKIN CONTACT: Wash skin for 10 minutes. Clothing contacted with material should be washed. If skin irritation develops, consult a physician.
INGESTION: Drink several glasses of water and consult a physician. Do not induce vomiting.
INHALATION: Move the person to fresh air and clear the airways. If not breathing, give artificial respiration. Immediately consult a physician.

5. Fire Fighting Measures

Flash Point (°C): n/a
Flammability: Solution is non-flammable
Fire-Extinguishing Media: Large fires: water spray or alcohol-type foam.
Small fires: Dry chemicals or carbon dioxide.
Explosion/Fire Hazards: None known.
Special Instructions for Firefighting Personnel: Wear full personal protective equipment and positive pressure breathing apparatus.

6. Accidental Release Measures

Transportation Spills: CHEMTREC 1-800-424-9300

Small spills may be washed into sewers with water.

7. Handling and Storage

Handling: Avoid contact with eyes, skin and clothing. Wash exposed areas after handling.
Storage: Store above 40°F to avoid freezing

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8. Exposure controls and personal protection

Engineering Controls: No special equipment required.
Eye Protection: Eye wash station.
Skin Protection: Exposed areas on the skin should be minimized by use of long-sleeved shirt and pants and chemical-resistant gloves.
Respiratory Protection: If vapor or mist is present, use NIOSH approved respirator.
Ventilation: No special equipment required.

9. Physical and Chemical Properties

Appearance: Clear liquid
Color: clear
Odor: mild alcohol odor
pH: 6.5-7.5
Melting Point (°C): not determined
Boiling Point (°C): 100°C (212°F)
Flash Point (°C): not determined
Specific Gravity (water=1): 1
Water Solubility (%): not determined
Viscosity: 500cSt at 40°C (104°F)
Vapor Pressure (mmHg): not determined

10. Stability and reactivity

Stability: Stable at normal temperatures and pressures.
Incompatibility: None
Hazardous Polymerizations: Do not occur.
Hazardous Decomposition: This product may produce toxic levels of the following compounds when heated to decomposition:
Carbon monoxide
Carbon dioxide
Aldehydes/Ketones
Hydrogen sulfide
Sulfur oxides
Other sulfur containing compounds

11. Toxicological Information

Oral: Believed to be LD50 2.00-5.00g/kg (rat)
Inhalation: (TLV) 5mg/m3
Skin: Believed to be LD50 1.00-2.00g/kg (rabbit)
Eye: Moderate irritant
Carcinogenicity: Non-carcinogenic

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12. Ecological Information

Chemical Fate Information: Product is readily biodegradable in wastewater treatment systems but is moderately toxic to aquatic life.
Biodegradability: Product components are classified as biodegradable under aerobic test conditions.

13. Disposal Considerations

Dispose according to federal, state and local laws.

14. Transport Information

Proper Shipping Name: Not regulated.
DOT Hazard Class: Not regulated.
Identification Number: Not regulated.
Packaging Group: Not regulated.

15. Regulatory Information

Federal EPA
SARA Title III:

Section 302/304 Extremely Hazardous Substances: None
Section 311 Hazardous Categorization:

Acute√ Chronic√ Fire√ Pressure Reactive N/A

Section 313 Toxic Chemicals: None

CERCLA Hazardous Substances: None
Volatile Organic Compounds: Isopropanol, 1,2-Propylene glycol
TSCA Status: All chemicals in this product are on the TSCA Chemical Substances Inventory.
State Right-to-Know
New Jersey: Subject to the New Jersey labeling requirements on package and bulk storage tanks.
International Regulations
Global Status: AICS, Australia; Canadian DSL & NDSL; PICCS, Philippines listed.

16. Other Information

Last Revised: 11/21/2018

The information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of the need that information is current, applicable and suited to the circumstances of use. Tersus Environmental assumes no responsibility for injury to vendee or third-party person proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, Tersus Environmental assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed.

END OF SDS SHEET

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SAFETY DATA SHEET
TersOx™ Nutrients-QR

Revision date: 2020-07-16
Version 1.0

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name: TersOx™ Nutrients-QR

Synonyms: Water soluble nitrogen and phosphorus nutrient salt supplement for microbial process

Product Form: Mixture

Recommended use of the chemical and restrictions on use

Recommended Use: For use in stimulating biological activity in soils and sludges
Remediation of contaminated groundwater and soils

Restrictions on Use: Use as recommended by the label

Details of the supplier and of the safety data sheet

Supplier
Tersus Environmental, LLC
1116 Colonial Club Rd
Wake Forest, NC 27587
Phone: +1-919-453-5577
Email: info@tersusenv.com

Contact Person
David F. Alden
Phone: +1-919-453-5577 x2002
Email: david.alden@tersusenv.com

Emergency telephone number

For leak, fire, spill or accident emergencies, call:

+1-919-453-5577 (Tersus Office Hours, 8:00 AM to 5:00 PM Eastern)
+1-800-424-9300 (Chemtrec 24 Hour Service – Emergency Only)
+1-703-527-3887 (Chemtrec Outside United States 24 Hour Service – Emergency Only)
+1-919-638-7892 Gary M. Birk (Outside office hours)

2. HAZARD IDENTIFICATION

Relevant identified uses of the substance or mixture

Hazard Classification	Category	H-statement
Skin irritant	2	H315
Eye irritant	2A	H319
Acute toxicity – Inhalation	4	H332
Specific Target Organ Toxicity – Repeated	2	H371
Mutagenicity	2	H341

Label elements
Hazard Pictograms



Hazard Statements
Causes skin irritation (H315)
Causes serious eye irritation (H319)
Harmful if inhaled (H332)
May cause damage to lungs through prolonged or repeated exposure to inhalation of Urea: Known to cause emphysema (H371)
Urea – suspected of causing genetic defects (H341)

Precautionary statements
P201 – Obtain special instructions before use.
P202 – Do not handle until all safety precautions have been read and understood.
P260 – Do not breathe dust.
P264 – Wash thoroughly after handling.
P270 – Do not eat, drink or smoke when using this product.
P271 – Use only outdoors or in a well-ventilated area.
P280 – Wear protective gloves, clothing, eye, and face protection.
P302 + P352 – IF ON SKIN: Wash with soap and plenty of water.
P304 + P340 – IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P311 + P313 – IF exposed or concerned: Call a POISON CENTER or doctor and get medical advice/attention.
P312 – Call a POISON CENTER or doctor if you feel unwell.
P332 + P313 – If skin irritation occurs: Get medical advice/attention.
P337 + P313 – If eye irritation persists: Get medical advice/attention.
P362 + P364 – Take off contaminated clothing and wash it before reuse.
P405 – Store locked up.
P501 – Dispose of contents/container in accordance with local, regional, and federal regulations.

Further information
Persons who have a compromised immune system or a history of severe allergic response should avoid contact and/or breathing dust or mist from product handling or manufacturing processes.

Other hazards
None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Formula Mixture

Hazardous components

Chemical Name	Concentration (%)	CAS Number
Urea	<75	57-13-6
Diammonium Phosphate	<25	7783-28-0
Tricalcium Phosphate	<1	1306-06-5

Synonyms are provided in Section 1.
Occupational exposure limits, if available, are listed in Section 8.

4. FIRST AID MEASURES

General Information	Check the vital functions. If unconscious place in recovery position and seek medical advice. In case of respiratory arrest, administer artificial respiration. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Take victim to a doctor if irritation persists. Remove affected person from source of contamination.
Eye Contact	Product is a severe eye irritant. Direct contact with eyes must be avoided. In case of contact with eyes, flush eyes with low pressure water for at least 15 minutes. If irritation persists, seek medical attention.
Skin Contact	Product may cause slight irritation. Prolonged or repeated direct contact with skin may cause reddening, itching and inflammation. In case of contact with skin, wash skin with soap and water. Remove contaminated clothing and wash. If irritation persists, consult a physician.
Inhalation	May cause sensitization by inhalation in hypersensitive individuals, irritation of respiratory tract, or physical interference with breathing. Avoid inappropriate handling which may result in dust generation. If inhaled, remove from contaminated area to fresh air. Initiate CPR if victim has stopped breathing. Administer oxygen if victim has difficulty breathing. Report situation. Seek medical attention if allergic response or difficulty breathing is exhibited. No incidences of health effects from dust inhalation have been reported.
Ingestion	Ingestion of material may cause gastric disturbance including irritation, nausea, vomiting, and diarrhea. If swallowed, rinse mouth and throat with tap water. Consult a physician if symptoms exist.
Most important symptoms and effects, both acute and delayed	Most important symptoms/effects, acute and delayed: A single dose of 100 g has been reported to cause mild central nervous system depression, e.g. drowsiness and slow reflexes. Sensitization (shortness of breath, wheezing, and labored coughing) take individual to emergency room.
Indication of any immediate medical attention and special treatment needed	If exposed or concerned, get medical advice and attention.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Dry chemical, carbon dioxide, chemical foam or water (all common agents as appropriate to surrounding fire – this material burns with difficulty).

Specific Hazards Arising from the chemical or mixture	Avoid mixtures with strong acids (nitric or perchloric) which may create explosive mixture.
Special Fire Fighting Procedures	Irritating toxic substances may be emitted on thermal decomposition. Exposed firefighters should wear self-contained breathing apparatus and protective clothing. Cool containers exposed to flames with water until well after the fire is out. Use water spray to reduce vapors. If risk of water pollution occurs, notify appropriate authorities. Avoid water in straight hose stream; will scatter and spread fire. Keep upwind. Do not inhale explosion and combustion gases. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Cool containers exposed to flames with water until well after the fire is out. Use water spray to reduce vapors. If risk of water pollution occurs, notify appropriate authorities. Avoid water in straight hose stream; will scatter and spread fire. Wear positive-pressure, self-contained breathing apparatus (SCBA) and chemical protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Provide enough ventilation. Advice for emergency responders: protective equipment see Section 8. Wear protective clothing as described in Section 8 of this safety data sheet. Do not smoke or use open fire or other sources of ignition. Contact with walking surface may result in formation of slippery film/falling hazard.
First Aid:	In case of contact with skin, wash with soap and water. If symptoms occur, seek medical attention. In case of contact with eyes, rinse with plenty of water for at least 15 minutes and see an eye specialist if irritation persists. In case of inhalation, remove to fresh air. In case of ingestion, drink water. If symptoms occur, seek medical assistance.
Environmental Precautions	Do not discharge into drains, sewers or watercourses or onto the ground. Inform the relevant authorities if this occurs. Spilled product should be removed immediately to avoid formation of dust. Contain spill, sweep up avoiding airborne dust. Provide enough ventilation. Recover product for reuse if possible. Avoid contamination of waterways and (if large quantity) vegetation.
Methods for Containment and Clean Up	Spilled product should be removed immediately to avoid formation of dust. Contain spill, sweep up avoiding airborne dust. Provide enough ventilation. Recover product for reuse if possible. Avoid contamination of waterways and (if large quantity) vegetation. Absorb in non-combustible material, vermiculite, dry sand or earth and place into containers.

7. HANDLING AND STORAGE

Precautions for safe handling	Avoid creating dust. Adequately ventilate when handling this product. Provide eyewash capability. Contain with applicable regulations. Avoid contact with eyes. Avoid inhalation of vapors and spray/mist. Remove contaminated clothing immediately. Clean contaminated objects and areas thoroughly observing environmental regulations. Keep away from sources of ignition – No smoking. Handle in accordance with good industrial hygiene and safety procedures. Discharge into the environment must be avoided. Keep container

	tightly closed. Either local exhaust or general room ventilation is usually required.
Hygiene measures	Handle in accordance with good industrial hygiene and safety procedures. Use good personal hygiene practices.
Conditions for safe storage, including any incompatibilities	Avoid mixtures with strong acids (nitric or perchloric) which may create explosive mixture.

8. EXPOSRE CONTROL / PERSONAL PROTECTION

Control parameters

Exposure guidelines, ingredients with workplace control parameters.

Name	CAS-No	TLV (ACGIH)	PEL (OSHA)
Urea	57-13-6	10mg/m3 {3}*	15mg/m3 {5}*
Diammonium phosphate	7783-28-0	10mg/m3 {3}*	15mg/m3 {5}*
Tricalcium phosphate	1306-06-5	10mg/m3 {3}*	15mg/m3 {5}*

* Specific limits not set for these chemicals. Limits are shown for Particles Not Otherwise Regulated (PNOR) or Particles Not Otherwise Classified (PNOC). First number is for total dust second number { } is for respirable dust.

Exposure Control

Protective equipment



Appropriate engineering controls	Provide adequate general and local exhaust ventilation. Observe any occupational exposure limits for the product or ingredients. Do not allow uncontrolled discharge of product into the environment.
Eye/face protection	The following protection should be worn: Safety glasses with shields, chemical splash goggles or face shield.
Respiratory protection	Dust mask or respirator for particle removal (NIOSH)
Hand protection	Neoprene. Vinyl, Rubber (natural, latex), Butyl rubber. Wear protective gloves made of the following material: Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. Polyvinyl chloride (PVC). Manufactured/tested in accordance with EN 374, Avoid the following conditions: Polyvinyl alcohol (PVA).
Other skin and body protection	Wear appropriate clothing to prevent any possibility of skin contact.
Hygiene measures	Wash promptly if skin becomes contaminated. Wash hands at the end of each work shift and before eating, smoking and using the toilet. When using do not eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	White granular solid
Odor	Mild ammonia odor
Odor threshold	Information Not Available
pH	7 – 10 (10% sol)
Melting point /Freezing Point	130 °C
Initial Boiling point and boiling point range	Does Not Apply
Flash Point	Does Not Apply
Evaporation rate	Does Not Apply
Flammability (solid; gas)	Information Not Available
Upper/lower flammability or explosive limits	Does Not Apply
Vapor pressure	Low
Vapor density	Does Not Apply
Relative density	Information Not Available
Solubility (ies)	100g / 100mL in water
Partition coefficient: n-octanol/water	Does Not Apply
Initial Boiling point and boiling point range	Does Not Apply
Auto-ignition temperature	Information Not Available
Decomposition temperature	Information Not Available
Viscosity	Does Not Apply
Other Physical/Chemical Properties	Specific Gravity at 25°C – 1.3

10. STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions and use.
Chemical stability	Information not available
Possibility of hazardous reactions	Information not available
Conditions to avoid	Avoid mixtures with strong acids (nitric or perchloric) which may create explosive mixture, extreme heat.
Incompatible materials	Strong alkalis, active metals (aluminum, magnesium), ammonia, inorganic materials. Strong oxidizers, chlorine compounds.
Hazardous decomposition products	Information not available
Hazardous Polymerization	Information not available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Acute toxicity	(low) LD50 > 1000 mg/kg body weight
Skin Corrosion/Irritation	Dust may cause slight skin irritation, prolonged or repeated direct skin contact may cause reddening, itching and inflammation.
Serious Eye Damage/Irritation	Dust may cause severe irritation.
Respiratory or Skin Sensitization	Dust may cause irritation or allergy in susceptible individuals.

	May cause respiratory allergy in susceptible individuals: sensitization (shortness of breath, wheezing, and labored coughing) take individual to emergency room.
Ingestion	May cause severe gastric disturbances, sore throat.
Germ Cell Mutagenicity	Information Not Available
Carcinogenicity	Information Not Available
Reproductive Toxicity	Information Not Available
Specific Target Organ Toxicity – Single Exposure	Information Not Available
Specific Organ Toxicity – Repeated Exposure	Information Not Available
Aspiration Hazard	Information Not Available
General Remarks	Information Not Available

European Chemical Agency data for urea: Additional information
The 24 -hour EC_{50} for urea in Daphnia was reported to be >10000 mg/l; urea is not acutely toxic to daphnids.
The 24-hour LC_{50} values for freshwater snail eggs, juveniles and adults were reported to be 14,241 mg/l, 18255 mg/l and 22998 mg/l. Following 48-hour exposure, the LC_{50} value for adults was calculated to be 13,477 mg/l. In another study, the 24-hour LC_{50} values for eggs, juvenile and adult snails were reported to be 13,532 mg/l, 24504 mg/l and 26024 mg/l, respectively. Following 48 hours exposure, the LC_{50} value for adults was calculated to be 21,412 mg/l. It is concluded that, under normal laboratory conditions, urea displays low molluscicidal activity. The 4-hour LC_{50} in mosquito (*Aedes aegypti*) larvae is reported to be 60,000 mg/l.
species: *Daphnia carinata* LC_{50} (72 h) 1,790 mg/L Diammonium Phosphate; Standard Methods for the Examination of Water and wastewater (APHA)

European Chemical Agency data for tricalcium phosphate:
A static freshwater toxicity test was conducted to determine the acute toxicity of tricalcium phosphate to the water flea, Daphnia magna according to OECD Guideline 202. Adverse effects and immobility were examined daily. The criterion of immobilization was an inability to swim for approximately 15 seconds after gentle stir. No mortality or adverse effects were observed at control or 100 mg/L (nominal). The 48-hours EC_{50} of tricalcium phosphate was >100 mg/L (measured concentration: >5.35 mg/L) in Daphnia magna. The concentration of the test substance was calculated using the concentration of calcium expecting the mean calcium concentration at control. The results suggest that the concentration of the test substance was significantly lower than nominal, and the test substance was insoluble in water. Therefore, the test results were expressed as nominal concentration.

12. ECOLOGICAL INFORMATION

Component		Species	Test Result
Aquatic			
Acute			
Crustacea	LC50	*Ceriodaphnia dubia*	>2,000 mg/L
Fish	LC50	Fathead minnow (*Pimephalas promelas*)	287.2 mg/L

Chemical Fate Information
Product is readily biodegradable in wastewater treatment systems.

Biodegradability
Readily degradable.

Excess product in waterways may encourage eutrophication.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods	Dispose according to federal, state and local laws. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Authority. Waste is suitable for

incineration.

14. TRANSPORTATION INFORMATION

UN Number	Mixture not classified as Hazardous according to Regulation (EC) 1272/2008.
UN Proper Shipping Name	n/a
Transport Hazard Class	n/a
Packing Group (if applicable)	n/a
Environmental Hazards	n/a
Special Precautions for User	n/a
Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code	n/a
DOT Proper Shipping Name	Chemicals not otherwise indexed (NOI) non-hazardous.

15. REGULATORY INFORMATION

All ingredients used are listed on the USEPA TSCA Inventory list.

Ingredients are not listed in: Reportable Quantity (49CFR 172.101), SARA Title III Section 302/313 (Extremely Hazardous Substance List/ Toxic Chemicals), RCRA Hazardous Waste, California Proposition 65, State Right to Know Laws (Connecticut, Florida, Illinois, Louisiana, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island)

16. OTHER INFORMATION

Mixture classified as not dangerous according to Regulation (EC) 1272/2008.

Observe employment restrictions for people.
Product is not listed with IARC, NTP, ACGIH or OSHA as a carcinogen.

Components not precisely identified are proprietary or non-hazardous. All chemical ingredients appear on the EPA TSCA inventory.

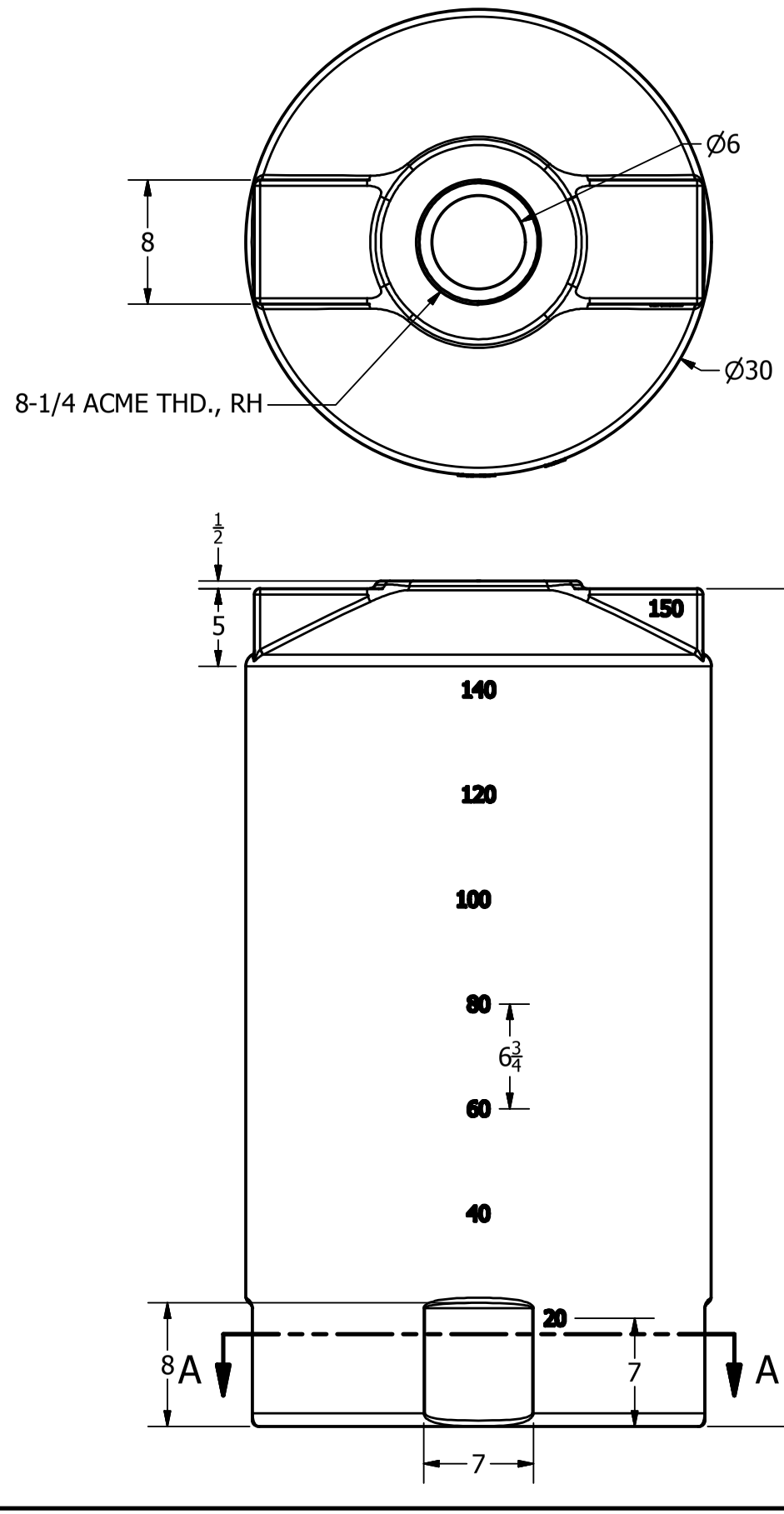
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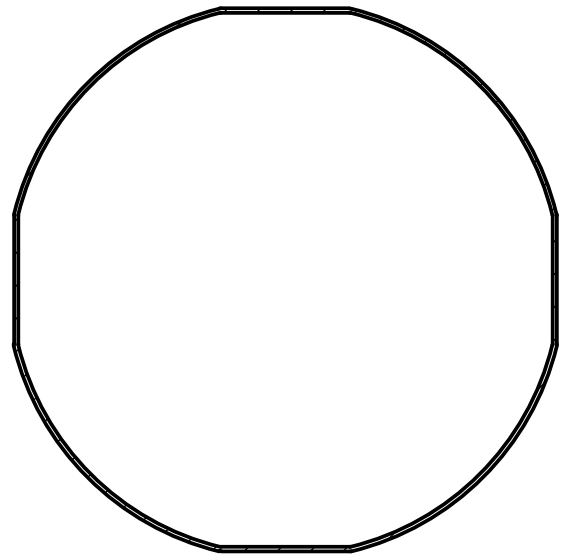
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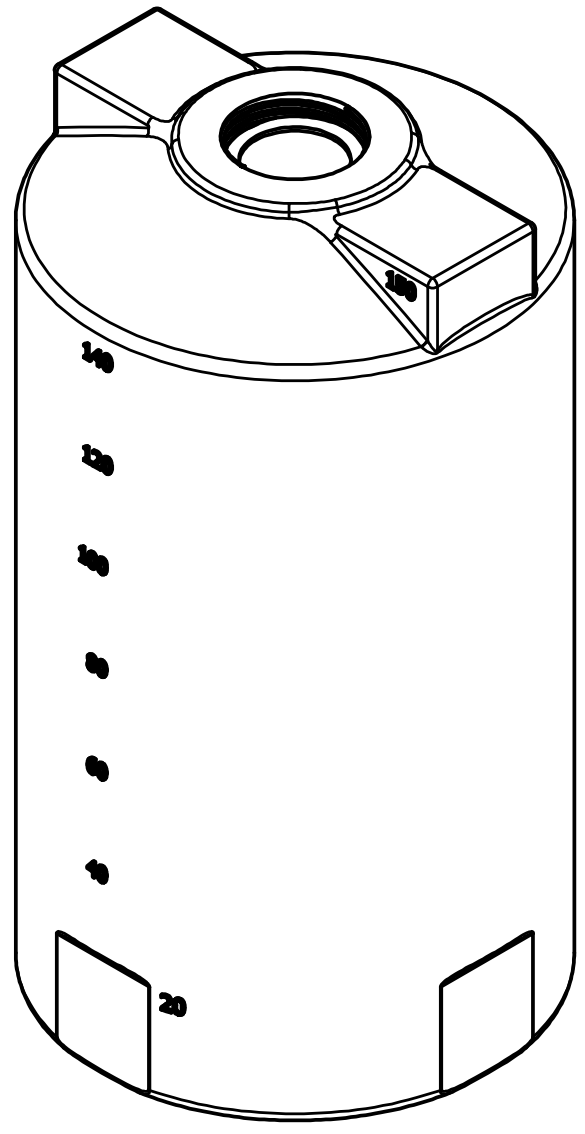
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End of Safety Data Sheet





SECTION A-A
SCALE 1:10



REVISION HISTORY			
REV	DESCRIPTION	DATE	AUTHOR
A	REDRAWN	7/1/2013	Michael Holden

DRAWN Jerry Paulson	7/11/2003	NORWESCO, INC. SAINT BONIFACIUS, MN
CHECKED		TITLE: 150 GALLON VERTICAL TANK X **25** DIAMETER
QA		
MFG		
APPROVED		

SIZE		DWG NO	REV
B			A

SCALE: 1/16 — SHEET 1 OF 1

CR Contractor Series

Technical Specifications

PSI: 100-135

CFM: 4.1 - 11.4

HP: 2-5.5

We are pleased to offer the following Atlas Copco CR Contractor Series, single-stage, cast iron piston air compressor. The contractor series is mobile and lightweight, designed to be portable. Multiple variants are available, from 115 volt to 230 volt, gas powered, 24 gallon horizontal and vertical, 60 gallon vertical, or 2x4 gallon twin tanks, ranging anywhere from 2-5.5HP.

CONTRACTOR SERIES FEATURES:

- Highly efficient inlet air filter
- Slow speed compressor pump with finned cylinder
- Cast iron design
- Stainless steel valves
- 115/230 volt, single-phase units
- Gas powered variant available
- Start/stop pressure switch control
- Magnetic starter included on simplexes
- Large multi-blade flywheel
- Wire belt guard
- Two-piece connecting rods
- Manual tank drain







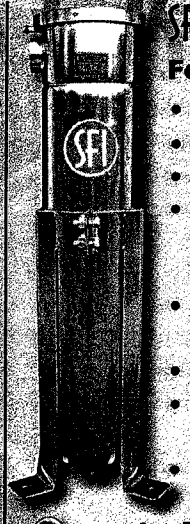
PURE PERFORMANCE

At Superior Filters, we understand what our customers need in filtration equipment. That's why we took our most popular vessels and created a large inventory to provide quick deliveries at competitive prices. When you work with Superior Filters you can depend on:

- Low cost without sacrificing quality. We worked years to develop a housing that delivers both.
- We understand the cost of lost production time. That's why we offer immediate shipping from our large in stock inventory.
- Quick turn-around on quotes and custom housings.
- An evaluation of your filtration needs to provide the best solution for custom housings.
- A trial test period to be certain our housing meets your specifications.
- Support after the sale to help with any issues or answer any questions.
- Inventory management to keep your operations up and running.
- A 3 year warranty on our housings.

Superior Filters Inc.

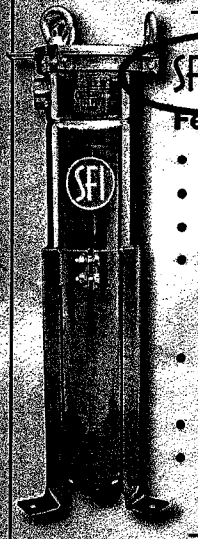
347 E. Main St.
Spring Arbor, Michigan 49283
Phone: 866.734.0100
Fax: 517.750.3192
www.superiorfilters.com



SF07-304 Quick Clamp Stainless Steel Filter Housing

Features:

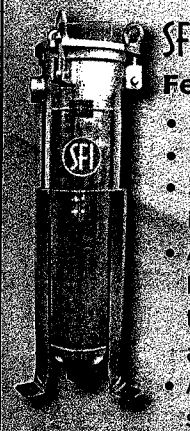
- Economically priced
- Large Inventory
- 304 stainless steel
- All housings, basket, legs and lid are electropolished to resist adhesion of dirt and scale
- Adjustable-height 304 stainless steel legs
- Buna O-rings seal
- Two housing lengths; (Size #1)15 or (Size #2)30 inches
- Easy to clean
- Pipe sizes 2" NPT connections in stock and are easily reduced
- 125 PSI working pressure
- Easy lid removal without tools, displacement in lid to help stop spillage
- Basket has 9/64 in. perforations and can be used as a strainer or with a large number of different bags



SF07-3 Lug Stainless Steel Filter Housing

Features:

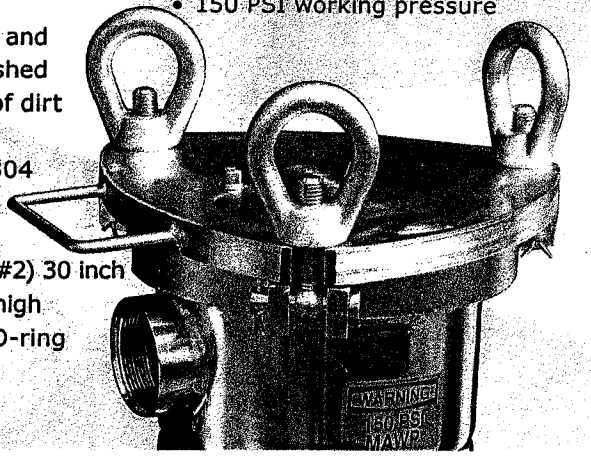
- 3 Lug Lid
- Large Inventory
- 304 stainless steel
- All housings, basket and legs are electropolished to resist adhesion of dirt and scale
- Adjustable-height 304 stainless steel legs
- Buna O-ring seal
- Basket depth; (Size #2)30 inch size
- Easy to clean
- Omega spring bag hold down
- Pipe sizes 2" NPT connections in stock and are easily reduced
- 150 PSI working pressure
- Basket has 9/64 in. perforations and can be used as a strainer or with a large number of different bags



SF08-3 Lug Stainless Steel Filter Housing

Features:

- 3 Lug Lid
- Large Inventory
- 304 stainless steel heavy duty industrial housing
- All housings, basket and legs are electropolished to resist adhesion of dirt and scale
- Adjustable-height 304 stainless steel legs
- Buna O-ring seal
- Basket depth; (Size #2) 30 inch
- Industrial strength-high quality basket has O-ring to minimize bypass
- Omega spring bag hold down
- Pipe sizes 2" NPT connections in stock and are easily reduced
- 150 PSI working pressure



PURE PERFORMANCE

At Superior Filters, everything we offer is guaranteed. That's why we have to provide our customers with the highest quality products and service. This results in exceptional customer satifaction. When you work with us, you can depend on:

- Low cost without sacrificing quality. We work with only the best material and have a high standard of manufacturing.
- We understand the cost of lost production time. That's why we offer Same Day Emergency Shipping.
- Fast delivery on standard orders.
- Private labels and drop shipping.
- Custom fabrication to meet specific requirements.
- Support after the sale to help with any issues or answer any questions.
- Inventory management to keep your operations up and running.

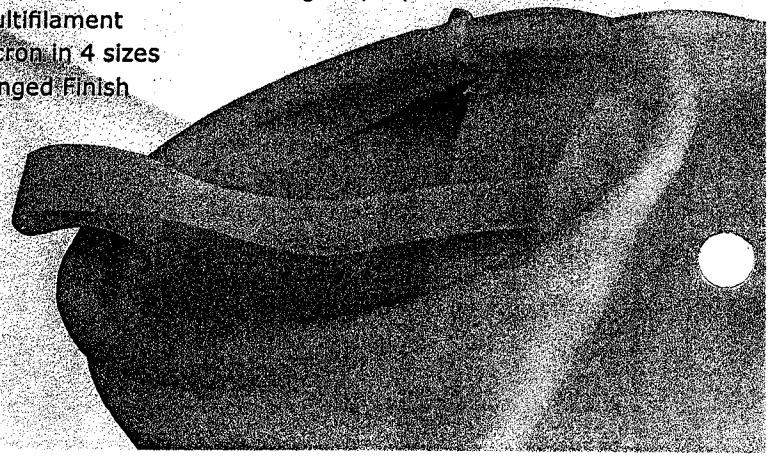
Call our knowledgable staff to help with media selection and sizing.



Superior Filter Bag Specifications

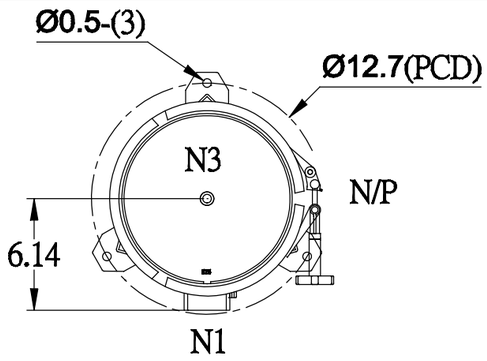
Media
- Polypropylene
  1-200 micron in 4 sizes
- Polyester
  1-200 micron in 4 sizes
- Nylon monofilament
  5-800 micron in 4 sizes
- Polyester Multifilament
  100-600 micron in 4 sizes
- Glazed or Singed Finish
- Scrim Cover

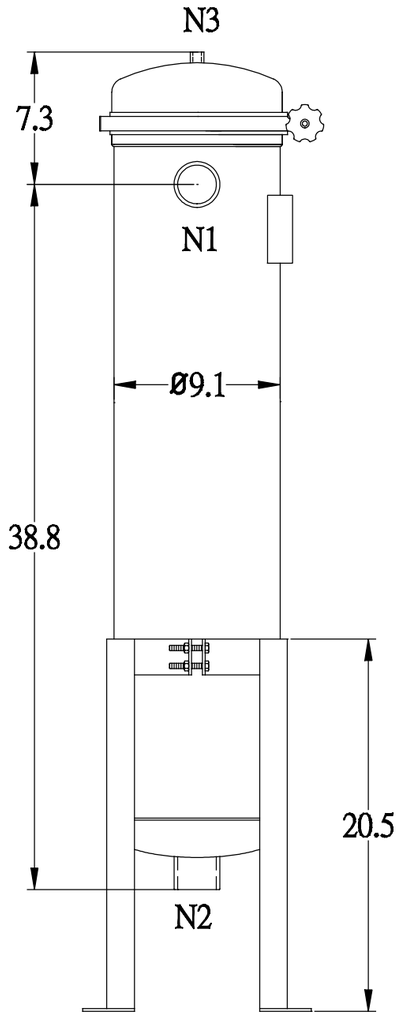
Rings or Flange
- Stainless Steel
  - Ring Size Range 4"-8"
- Carbon Steel
  -Ring Size Range 4"-8"
- Polypropylene
  -Flange 4", 7", 8"

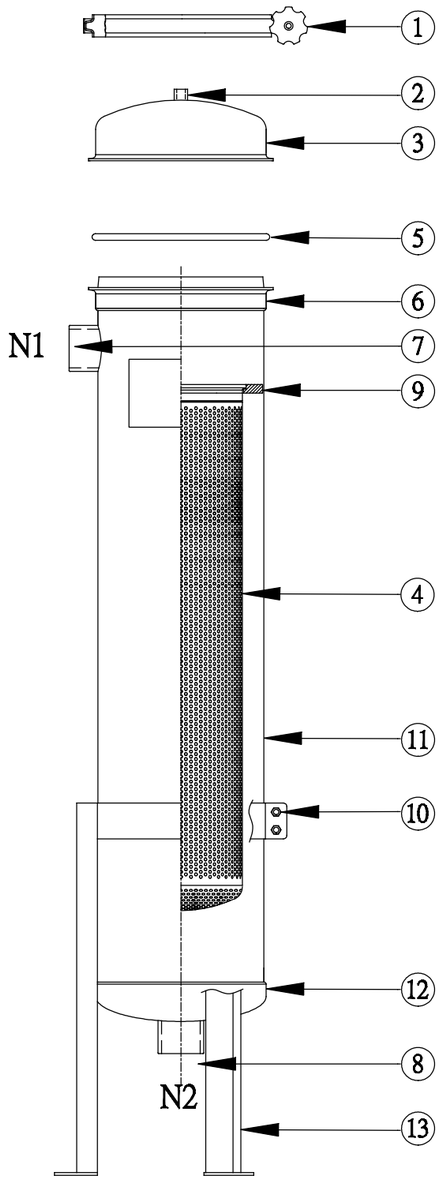


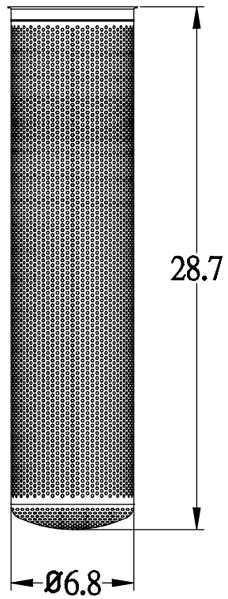
SFI Superior Filters Inc.

347 E. Main St.
Spring Arbor, Michigan 49283
Phone: 866.734.0100
Fax: 517.750.3192
www.superiorfilters.com









BILL OF MATERIAL

ITEM	AMT	DESCRIPTION	WT

NO	DESCRIPTION	SPECIFICATIONS	QTY
1	CLAMP	SUS 304	1
2	VENT	SUS 304	1
3	TOP COVER	SUS 304	1
4	BASKET	SUS 304	1
5	O-RING	EPDM	1
6	FLANGE	SUS 304	1
7	INLET	SUS 304	1
8	OUTLET	SUS 304	1
9	FILTER BAG PLATE	SUS 304	1
10	BOLT	SUS 304	2
11	SHELL	SUS 304	1
12	BOTTOM COVER	SUS 304	1
13	LEG SUPPORT	SUS 304	1

DESIGN CONDITION	
DESIGN PRESSURE	150 PSI
OPERATION PRESSURE	
DESIGN TEMPERATURE	149° F
OPERATION TEMPERATURE	

DIMENSION			
NO	MATERIAL	NAME	REMARK
N1	2" NPT-F	INLET	
N2	2" NPT-F	OUTLET	
N3	$\frac{1}{4}$" NPT-F	VENT	

SYM	DESCRIPTION	DATE	BY	CHK

REVISIONS

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

TOLERANCE
UNLESS OTHERWISE SPECIFIED
INCHES
2 PLACES = ±.01
3 PLACES = ±.005
4 PLACES = ±.0025
FRACTIONS = ±1/16"

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FILTRA•SYSTEMS
ISO 9001-2008
BETTER FILTRATION THROUGH BETTER TECHNOLOGY
23900 HAGGERTY ROAD – FARMINGTON HILLS, MICHIGAN 48335
www.filtrasystems.com

TITLE: -

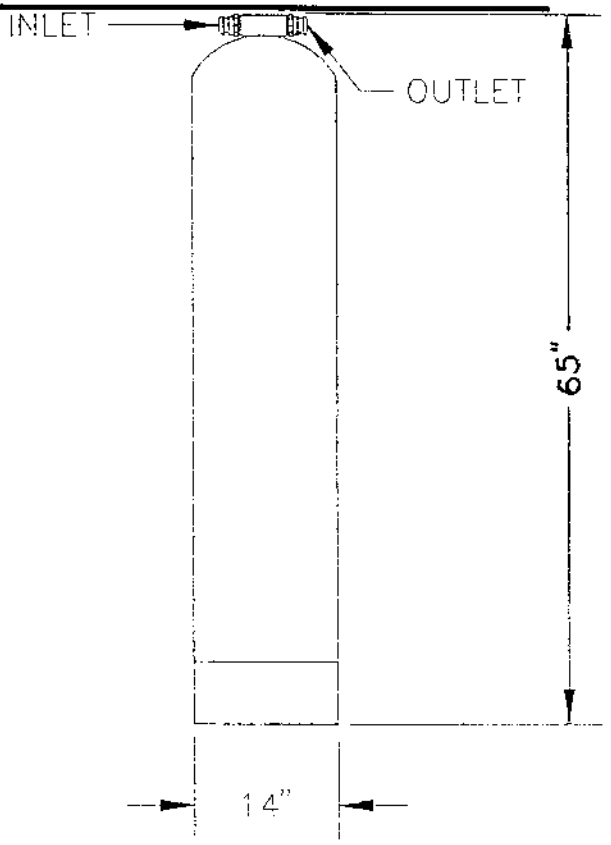
CUSTOMER: -

DWG. TITLE: FSC201020254NR-B

DR. DM	DATE 15SEP15	DWG. NO. -	JOB NO. -
CHK. -	SCALE 1:4		

Carbon Service & Equipment Company
A Division of Encotech, Inc.

AQUA 150 HP



TYPICAL FLOWS	**1-5 gpm**
MAXIMUM SUGGESTED FLOW	**7 gpm**
MAXIMUM OPERATING PRESSURE	**150 psig**
MAXIMUM TEMPERATURE	**140°F**

STANDARD FEATURES

- 150 lbs. coal base, virgin or reactivated carbon.
- Heavy duty, corrosion resistant polyethylene lined fiberglass reinforced composite vessel.
- Advanced internal distribution and collection systems designed to optimize carbon usage rates, minimizing operating expenses.
- 1" FNPT inlet and outlet connections.

OPTIONAL FEATURES

- Cam-Lok fittings w/caps
- Pressure gauge assembly
- Sample port assembly
- Flexible hose assemblies
- Solids prefilter systems
- Pressure relief valve

P.O. Box 305, Eighty Four, PA 15330 · 724-222-3334 · Fax 724-222-4095
P.O. Box 618102, Orlando, FL 32861 · 407-313-9113 · Fax 407-313-9114

CARBONAIR

Mobile Water Treatment Specialists
1-800-526-4999

Home | About Carbonair | Health & Safety | References | Contact Us

Mobile Water Treatment Services
Water Treatment & Remediation Equipment Rental
Filter Media, Services & Equipment
Modeling and Design Services
STAT Low-Profile Air Strippers
COWS Oil/Water Separators
Used Equipment
IMP Customer Log In

COWS Oil/Water Separators

Carbonair's coalescing oil/water separators (COWS) are designed for use in groundwater remediation, wastewater treatment and treatment of storm water runoff. Our separator design incorporates coalescing media that facilitates the collection and removal of small oil droplets and also facilitates the effective removal of fine suspended solids that may not be removed with quiet zone separators. Our oil/water separators are constructed of stainless steel, epoxy coated carbon steel or fiberglass reinforced plastic and are highly resistant to corrosion.



COWS Oil/Water Separator Specifications

Model> F=FRP; S=Steel	COWS 10F	COWS 15F	COWS 25S	COWS 50F	COWS 75F	COWS 150S	COWS 250S
Nominal Flow (gpm)	10	15	25	50	75	150	250
Maximum Hydraulic Capacity (gpm)	50	75	75	100	200	300	300
Length	60"	60"	60"	64"	80"	86"	124"
Width	28"	28"	28"	52"	52"	52"	52"
Height	34"	47"	47"	47"	47"	72"	72"
Inlet/Outlet (NPT)	2"	3"	3"	3"	4"	6"	6"
Oil Outlet (NPT)	2"	2"	2"	2"	2"	2"	2"
Weight Empty (pounds)	95	115	800	325	400	2,111	2,640
Media Volume (cubic feet)	4	8	8	16	24	48	80
Media Surface Area (sq feet)	476	952	952	1,904	2,856	5,712	9,250
Working Volume (gallons)	61	111	111	211	273	580	869
Reservoir (gallons)	45	65	65	152	195	271	271

Standard Features

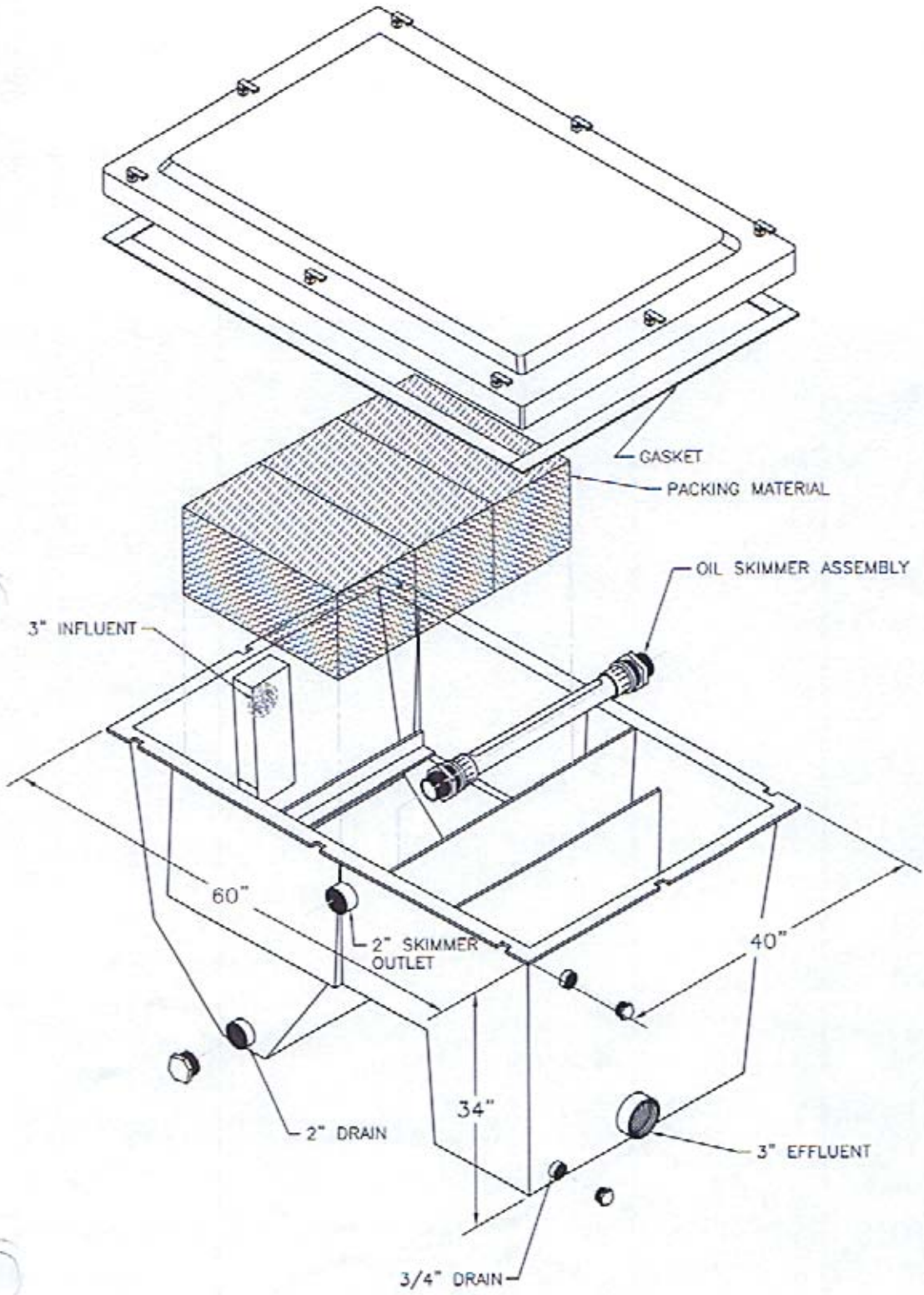
- Fiberglass construction (COWS 5, 10, 50 and 75)
- Steel construction (COWS 25, 150, 250)
- Cross-fluted PVC coalescing media packs
- Vapor tight cover with quick release latches
- Solids collection sumps with clean out access

Optional Components

- Custom designed equipment
- Water discharge pump with level controls
- Level controls
- Sludge discharge pump
- Oil discharge pump
- External oil reservoirs
- Elevation stand
- Larger sizes available

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COWS-15F
15 GALLON, FRP
OIL/WATER SEPARATOR

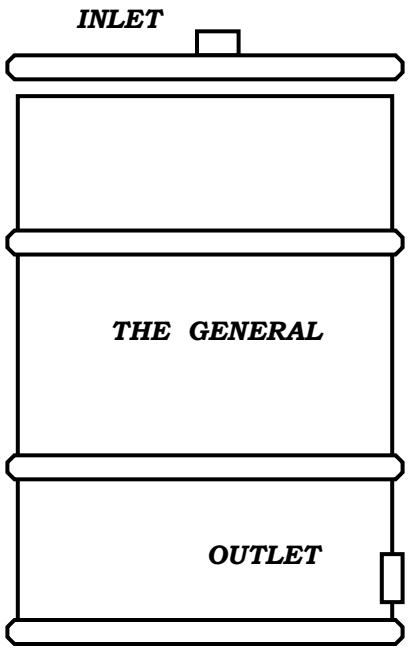


Sales Drawing #151143
96.09.10
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GC BONIFIBERS®

oil sorbent media

GC BONIFIBERS™ are a particulate filter and coalescing/holding media for undissolved hydrocarbons. The distinctive construction of *BONIFIBERS™* traps and holds emulsions and small particles. Melt spun from polyolefin, the fibers are composed solely of hydrogen, carbon and oxygen which makes them very oleophilic and hydrophobic. The individual fibers are very fine making the mass of interlocking *BONIFIBERS™* very light (2 lbs/cu.ft.) with an appearance like cotton batting.



When *BONIFIBERS™* are used in a packed column treatment system to treat an oil/water mixture, the interlocked fibers provide for the impingement of very small droplets of oil. As oil removal progresses, the spaces between the fibers are filled. The large volume of spaces in the *BONIFIBERS™* results in a capacity of 25 pounds of oil per pound of fiber. Test results show large influent concentrations being reduced to the 5-PPM range making *BONIFIBERS™* an excellent pretreatment for activated carbon.

General Carbon Corp. supplies *BONIFIBERS™* in 55 Gallon drum treatment units as well as bulk refill boxes. The drums are ready for use and have 1" FNPT inlet/outlet connections. Maximum flow is 10 GPM (Downflow) with lower flow rates recommended for better removal efficiency. This filter can be a cost effective pretreatment for many GAC systems. If a larger flow rate system is needed, please contact our office for assistance.

33 Paterson Street, Paterson, New Jersey 07501 Tel: 973 523 2223 Fax: 973 523 1494
www.generalcarbon.com sales@generalcarbon.com

Prosper Environmental

Groundwater Bioremediation Solutions

PROSPER Environmental

INFUSOR® Tech Brief

Advancing the Science of Gas Infusion Remediation

Prosper Environmental LLC

Prosper Technologies LLC is the new exclusive owner of the Gas Infusion (GI) intellectual property and worldwide patents. This Nanotechnology is the only one in the world that can instantaneously infuse supersaturated levels of oxygen into liquids, while simultaneously removing a gas.

Prosper Environmental LLC, a subsidiary of Prosper Technologies, is responsible for managing our groundwater and surface water remediation business sector. We have offices in New York, Florida and New Brunswick Canada. Our dedicated staff has over 17 years of experience designing, testing, manufacturing and servicing the groundwater remediation consulting community and regulatory agencies.

Our innovative remediation systems help our clients reduce uncertainty, minimize risks, and achieve cost-effective results.

Groundwater Remediation of:

- Petroleum Hydrocarbons
- BTEX & PAHs
- Oxygenates
- Chlorinated Solvents
- Pesticides/Herbicides
- 1, 4 Dioxane
- Nitrates
- Per- and Polyfluoroalkyl Substances
- pH Adjustment

Gas Infusion

Gas Infusion is a mass transfer operation whereby sparingly soluble gases are dissolved into liquids. The efficiency of this process creates stable liquid streams containing enormous quantities of dissolved gas on scales ranging from cc/min to thousands of GPM. We produce these enormous levels of dissolved gas at a fraction of the energy cost of any other process.

How The INFUSOR® Works

The INFUSOR® is an above ground gas delivery device that accelerates site closure through enhanced natural attenuation. The patented gas infusion technology delivers supersaturated levels of dissolved gases into liquids. Supersaturation occurs inside the INFUSOR unit. DO output is dependent on the water flow rate and pressure. The unit requires vertical mount and comes in two sizes: 24" or 42".

INFUSOR® Design Advantages

- Low cost, small footprint, easy operation
- Use for hot spot, polishing or source treatment
- Stationary location, mobile cart or trailer mounted
- Locate adjacent to injection wells or short distance away
- Shallow trench or above ground drop tubes feed multiple wells
- Connect water supply to water inlet (spigot or groundwater)
- Powered by inlet gas and water pressure
- Delivers 40-135 PPM DO
- Use for recirculation and reinjection (to maximize influence)
- Solar power & electronics optional
- Slip stream optional (for nutrient addition)
- No off-gases or hazardous by-products
- Promotes Green Remediation BMPs
- Can be used for aerobic, anaerobic or cometabolic strategies

Aerobic, Anaerobic & Cometabolic Solutions

Overview

Overview of Aerobic Cometabolic Treatment

In the aerobic cometabolic bioremediation processes indigenous bacteria or bioaugmented strains are stimulated by adding oxygen and a cometabolic growth substrate to trigger the production of enzymes that can oxidize or degrade the target pollutant via cometabolism. The iSOC® system is used to deliver oxygen as a terminal electron acceptor along with a gaseous growth substrate, typically an alkane gas, in a process known as Co-infusion to stimulate complete in-situ contaminant destruction. The method is most useful for bioremediation of pollutants that are not themselves good aerobic growth substrates for bacteria.

Cometabolic treatment has been found to be particularly effective for the chlorinated solvent trichloroethylene (TCE) and other lower or less oxidized chlorinated aliphatic hydrocarbons (DCE, VC, TCA, DCA, CF, and MC). The process has also been found to be effective for treatment of groundwater contaminated with the gasoline additive MTBE and other persistent organic compounds such as pesticides. At some sites with mixed groundwater contaminants (i.e. petroleum hydrocarbons with chlorinated solvents or MTBE), the necessary substrate for inducing aerobic cometabolism of the target pollutant may already be present and all that is needed is the infusion of oxygen. Various aliphatic and aromatic hydrocarbon compounds have been found to function as cometabolic treatment substrates and significant research and development has focused on the use of alkane gases (i.e. methane and propane) for the purpose.

Delivery of Oxygen and Gaseous Cometabolic Substrates with the iSOC® System for Bioremediation

Implementation of the aerobic cometabolic bioremediation processes utilizes the iSOC® gas delivery system based on inVenture's patented Gas inFusion technology - a unique method of infusing supersaturated levels of dissolved gas into liquids. At the heart of iSOC® is a proprietary structured polymer mass transfer device that is filled with micro-porous hollow fiber material and provides a large surface area for mass transfer - in excess of 7000 m2/m3. The fiber is hydrophobic and therefore excludes water. The system efficiently delivers gas to liquid by mass transfer without sparging.

The Co-infusion process involves the configuration of iSOC treatment wells to deliver oxygen and a dilute (2 to 4.5%) non-flammable mixture of alkane gas (i.e. propane) or alkene gas (i.e. ethene) in inert nitrogen gas to the groundwater treatment area. The iSOC units are placed in treatment wells and provide an inherently large surface area that allows for oxygen and alkane gas mass transfer to groundwater without sparging. The treatment area established by Co-inFusion wells can be designed as a grid to treat source areas or as a treatment curtain or fence of treatment wells to cut off plume migration.

In an aerobic cometabolic bioremediation application, the iSOC® saturates the treatment well with dissolved oxygen (DO), typically 40-200 PPM depending on the immersion depth of the iSOC® in groundwater. A natural convection current and a designed release bubble from the top of the iSOC® mixes the water column in the well resulting in a relatively uniform DO concentration. The alkane or alkene gas is delivered to the iSOCs intermittently, either to dedicated cometabolic gas delivery wells or alternately switching gases at the oxygen delivery wells. A curtain of dissolved gas rich water around and downgradient of the treatment well is formed by diffusion, advection and dispersion, forming a treatment zone where enhanced bioremediation removes target contaminants.

The cometabolic gas/nitrogen mixture is added intermittently by manually switching with a gas manifold system or by a mechanical system controlled by a timer as shown in the following schematic.

Overview

Overview of Enhanced Bioremediation

The in situ groundwater bioremediation process relies on microorganisms (soil bacteria) that are stimulated through the control of environmental factors to reduce contaminant concentrations in groundwater. These soil bacteria utilize petroleum hydrocarbons as a source of carbon for biomass production and energy. In aerobic processes, terminal electron acceptors such as dissolved oxygen and where necessary other essential nutrients can be delivered to groundwater to enhance natural attenuation of fuel related hydrocarbons, including gasoline constituents benzene, toluene, ethylbenzene and total xylenes (BTEX), methyl tertiary butyl ether (MTBE) and tertiary butyl alcohol (TBA), polycyclic aromatic hydrocarbons (PAH) and a variety of other hydrocarbons. In-situ bioremediation technology has been extensively studied and applied since the mid 1980's.

Delivery of Oxygen with the iSOC® System for Hydrocarbon Bioremediation

Enhanced bioremediation stimulated by the infusion of dissolved oxygen has been proven to be an effective technology to reduce all forms of dissolved hydrocarbons in groundwater. The efficient delivery of dissolved oxygen into ground water is essential to insure that an abundance of oxygen is available for the bioremediation process at a reasonable cost.

The iSOC® gas delivery system is based on inVenture's patented Gas inFusion technology - a unique method of infusing supersaturated levels of dissolved gas into liquids. At the heart of iSOC® is a proprietary structured polymer mass transfer device that is filled with micro-porous hollow fiber material that provides an enormous surface area for mass transfer - in excess of 7000 m2/m3. It is hydrophobic and therefore excludes water. The system efficiently delivers gas to liquid by mass transfer without sparging.

In an aerobic bioremediation application, the iSOC® supersaturates the treatment well with low decay dissolved oxygen (DO), typically 40-200 PPM depending on the immersion depth of the iSOC® in groundwater. A natural convection current and a designed release bubble from the top of the iSOC® fills the well with uniform DO. The supersaturated DO curtain of water disperses around the well into the adjacent groundwater forming a treatment zone and enhanced bioremediation removes target contaminants. Placement of injection wells depends on site-specific conditions and treatment objectives as described further below. Treatment well screens typically span the full thickness of the contaminated groundwater zone. The iSOC® system is installed in a few hours to days depending on the number of treatment wells. iSOC® units are easily moved from well to well to optimize performance and remediation strategies.

iSOC® is constructed of high quality SS316 stainless steel using the latest manufacturing equipment and a proprietary structured polymer mass transfer device. iSOC® is 1.62" (41 mm) in diameter and 12.65" (321 mm) long with a barb connector for 0.167" (or 4 mm) ID polyurethane tubing. The housings for the pressure and flow control unit and the drain plug are made from nylon. iSOC® has a lifting ring for connecting to a suspension line for insertion in 2" (50 mm) or larger monitoring wells. The unit is connected to a regulated supply of industrial-grade compressed oxygen.

Experience in the field has shown that in each treatment well where an iSOC® is installed, high levels dissolved oxygen levels of can easily be achieved, depending on the height of the water column in the well. Each atmosphere of pressure allows for a maximum of 40 ppm of dissolved oxygen. Oxygen is continuously infused into the aquifer over a period of several months to up to several years, as needed. During this time, a large and continuous supply of oxygen is infused into the groundwater system to provide significant enhanced degradation of hydrocarbons, including BTEX and MTBE/TBA. Oxygen is infused from the iSOC® into the monitoring well at a typical rate of 15 cubic centimeters/minute.

Gas Infusion's Bioremediation Capabilities

PROSPER Environmental
Innovative Technology Solutions

Gas inFusion Contaminant Treatment Guide

CONTAMINANTS	AEROBIC				ANAEROBIC			COMETABOLIC				NAPL
	Oxygen Gas InFusion				Hydrogen Gas InFusion			Oxygen & Alkane Gas InFusion				CO_2 Gas InFusion
	BioFlo	gPRO	InFusor	ISOC	gPRO	HISOC	InFusor	BioFlo	gPRO	InFusor	ISOC	gPRO
BTEX												
Benzene	Y	Y	Y	Y								Y
Toluene	Y	Y	Y	Y								Y
Ethylbenezene	Y	Y	Y	Y								Y
Xylenes	Y	Y	Y	Y								Y
PAHs												
Acenapthene	Y	Y	Y	Y								Y
Anthracene	Y	Y	Y	Y								Y
Chrysene	Y	Y	Y	Y								Y
Fluorene	Y	Y	Y	Y								Y
Naphthalene	Y	Y	Y	Y								Y
Pyrene	Y	Y	Y	Y								Y
Oxygenates												
Methyl Tertbutyl Ether (MTBE)	Y	Y	Y	Y								Y
Tertbutyl Alcohol (TBA)	Y	Y	Y	Y								Y
Petroleum Additives												
Octane	Y	Y	Y	Y								
Dodecane	Y	Y	Y	Y								
C20 Alkane	Y	Y	Y	Y								
Petroleum Hydrocarbons												
Creosote	Y	Y	Y	Y								
Chlorobenzenes												
Chlorobenzene	Y	Y	Y	Y								Y
Dichlorobenzene	Y	Y	Y	Y								Y
Trichlorobenzene	Y	Y	Y	Y								Y
Chlorinated Solvents												
Tetrachloroethene (PCE)					Y	Y	Y	Y	Y	Y	Y	Y
Trichloroethene (TCE)					Y	Y	Y	Y	Y	Y	Y	Y
Dichloroethene (DCE)					Y	Y	Y	Y	Y	Y	Y	Y
Trichloroethane (TCA)					Y	Y	Y	Y	Y	Y	Y	Y
Dichloroethane (DCA)					Y	Y	Y	Y	Y	Y	Y	Y
Carbon Tetrachloride (CT)					Y	Y	Y	Y	Y	Y	Y	Y
Chloroethane					Y	Y	Y	Y	Y	Y	Y	Y
Chloromethane					Y	Y	Y	Y	Y	Y	Y	Y
Chlorotoluene					Y	Y	Y	Y	Y	Y	Y	Y
Methylene Chloride					Y	Y	Y	Y	Y	Y	Y	Y
Vinyl Chloride (VC)					Y	Y	Y	Y	Y	Y	Y	Y
Dichloropropane					Y	Y	Y	Y	Y	Y	Y	Y
Dichloropropene					Y	Y	Y	Y	Y	Y	Y	Y
Hexachlorobutadiene					Y	Y	Y	Y	Y	Y	Y	Y
Trichloropropane					Y	Y	Y	Y	Y	Y	Y	Y
Trichloropropene					Y	Y	Y	Y	Y	Y	Y	Y
Bis (2-chloroethyl) ether (BCEE)					Y	Y	Y	Y	Y	Y	Y	Y
Bis(2-chloroethoxy) methane (BCEM)					Y	Y	Y	Y	Y	Y	Y	Y
Pesticides/Herbicides												
DDT, DDD, DDE	Y		Y	Y								
2,4D	Y		Y	Y								
2,4,5-T	Y		Y	Y								
Toxaphene	Y		Y	Y								
Dieldrin	Y		Y	Y								
Miscellaneous												
1, 4 Dioxane	Y	Y	Y	Y				Y	Y	Y	Y	
Acetone	Y	Y	Y	Y								Y
Nitrates	Y	Y	Y	Y				Y	Y	Y	Y	
Trimethylbenzene	Y	Y	Y	Y								
Styrene	Y	Y	Y	Y								

pH Adjustment	Gas inFusion		
	ISOC	BioFlo	gPRO
pH less than 8	Ammonia (NH_3)	Ammonia (NH3)	Ammonia (NH_3)
pH greater than 8	Carbon dioxide (CO_2)	Carbon dioxide (CO2)	Carbon dioxide (CO_2)
pH greater than 10	Sulfur dioxide (SO_2)	Sulfur dioxide (SO2)	Sulfur dioxide (SO_2)

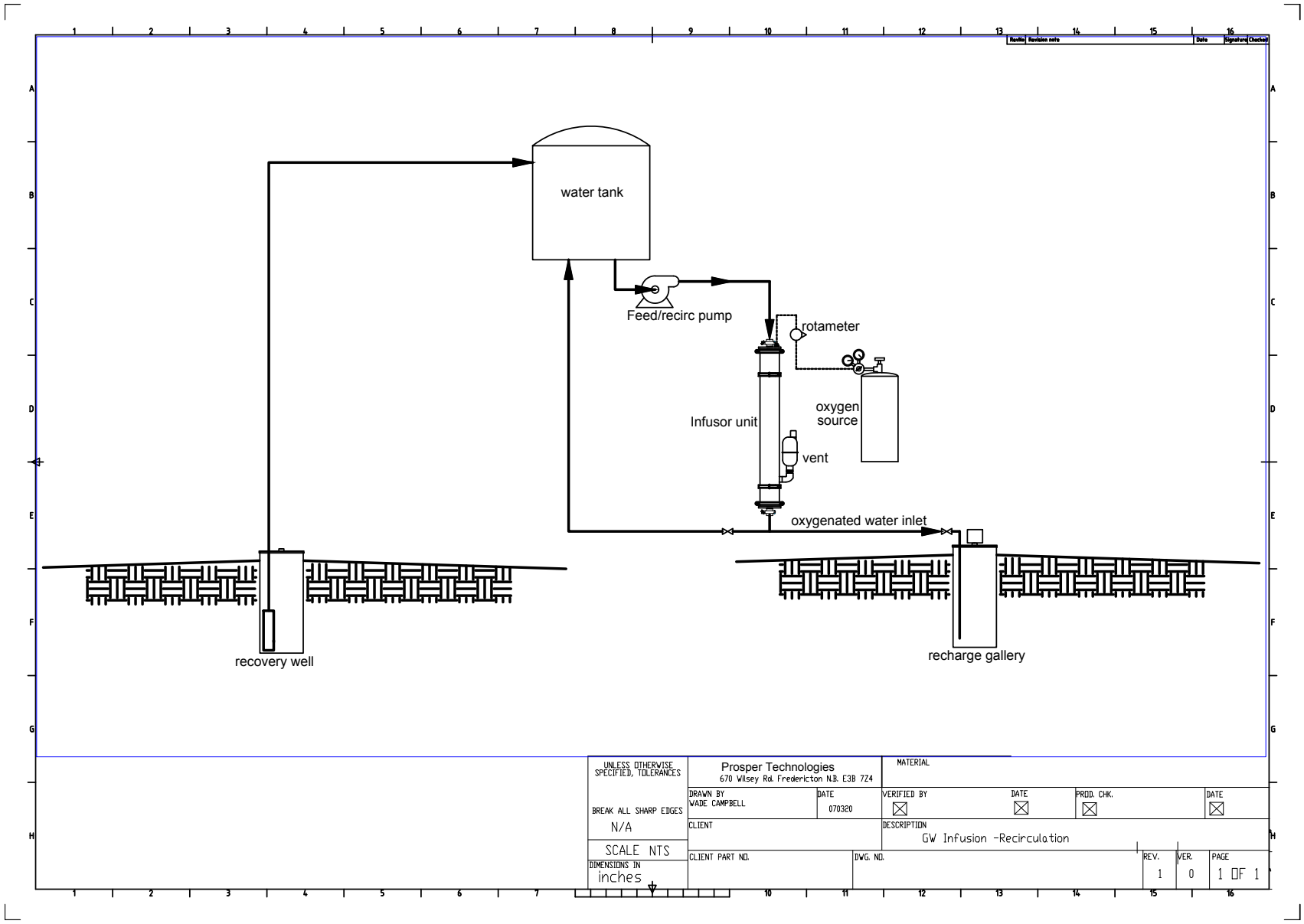
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Proposed Solution - Gas Infusion System Layout

This system layout can be used for recirculation, and also for direct feed. It will easily handle 1-5 GPM. At well over 40 ppm. For example, at 15 psi operation, (without pressure booster), the 4" Gas Infuser will produce 45 LPM of water flow at 42 PPM. With the booster, it will produce 135 PPM on demand at 20 LPM.



Gas Infuser Performance Data

Recirculation Performance testing 150813

42"x4" dia infusor recirc into open 65 gallon tank.

pump- jacuzzi 3/4 hp j class

H20 Flow	30 lpm	
o2 flow	3 lpm	
h20degC	19.2	
h20 psi	44	
ppm start (mg/l)	2.8	
ppm finish(mg/l)	81.2	(15 min.)
% saturation	870	

1/2"od x 3/8" id outlet tubing for laminer flow
to deliver oxygenated water start out with 3/8"id. hose, increase to 1/2" id, then to 3/4" id.

	test1 1/4"id hose			test2 (1/4)"id +(1/2)"hose			test3 1/4"+(1/2)+(3/4)hose	
Time(min)	do(mg/l)	%sat		do(mg/l)	%sat		do(mg/l)	%sat
0	2	22.58		2.8	31.612		2.8	31.612
2	10.7	120.803		10.1	114.029		21.4	241.606
3	13	146.77		14.6	164.834		24.4	275.476
4	14.5	163.705		20.1	226.929		36.7	414.343
5	28.2	318.378		24.5	276.605		41.7	470.793
6	30.8	347.732		30.8	347.732		46.9	529.501
7	35	395.15		32.4	365.796		59.6	672.884
8	39.9	450.471		38.7	436.923		55.6	627.724
9	48.7	549.823		40.9	461.761		63	711.27
10	53.2	600.628		43.2	487.728		66	745.14
11	59	666.11		52.4	591.596		70	790.3
12	62	699.98		63.4	715.786		77.1	870.459
13	64	722.56		71.1	802.719		82.2	928.038
14	66	745.14		74.5	841.105		84.8	957.392
15	68	767.72		76.3	861.427		85.9	969.811

Please read and save these instructions. ***Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.***

Dayton® Close-Coupled Centrifugal Pumps

Cast Iron, Bronze and 316 Stainless Steel

Description

Dayton close-coupled cast iron, bronze or 316 stainless steel units pump continuously, producing high flow rates under low-head conditions. Designed for continuous low-pressure circulation and transfer of nonflammable liquids, utility, boiler feed, general transfer, filtration, cooling towers, condensate return, marine applications, fountains, boosters, water circulation, irrigation, spraying systems, jockey pump service, chemical processing, aggressive liquid applications and other general purpose pumping compatible with pump component materials where no suction lift or no self priming is required.

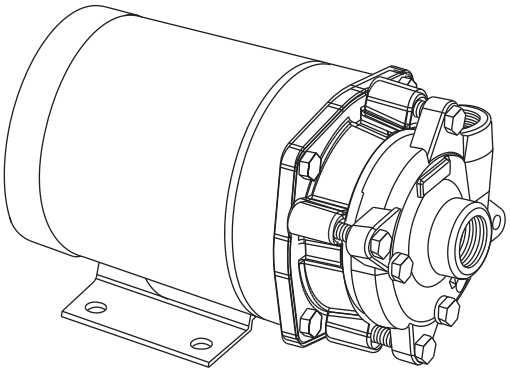


Figure 1

Specifications

Temperature..... 40°F to 200°F max
Max Inlet Pressure PSI (kpa)..... 200 (1379)
Impeller..... Semi Open
Paint..... Air dry enamel
Seal..... Carbon / Ceramic mechanical Seal
Speed..... 3450 RPM
Motor..... Open drip proof / Totally enclosed fan cooled construction (56J Frame) and are rated for continuous duty operation.
Single Phase..... Capacitor start. Includes overload protection in motor
Three Phase..... Must be installed with magnetic starter which provides full 3-leg protection.

Cast Iron Models	Bronze Models	316 Stainless Steel Models	Motor Details					Full Load Amps	Port Size	
			HP	Phase	Volt	Hz	Enclosure		Suction	Discharge
2ZWN9A	2ZWR4A	2ZWT8A	1/3	1	115/230	60	ODP	7.5/3.8	1″	3/4″
2ZWP1A	2ZWR5A	2ZWT9A	1/2	1	115/230	60	ODP	8.4/4.8	1¼″	1″
2ZWP2A	2ZWR6A	2ZWU1A	1/2	3	208-230/460	60	ODP	1.8-1.7/0.9	1¼″	1″
2ZWP3A	2ZWR7A	2ZWU2A	3/4	1	115/230	60	ODP	11.3/5.6	1¼″	1″
2ZWP4A	2ZWR8A	2ZWU3A	3/4	3	208-230/460	60	ODP	2.7-2.5/1.2	1¼″	1″
2ZWP5A	2ZWR9A	2ZWU4A	1	1	115/230	60	ODP	14.4/7.2	1½″	1¼″
2ZWP6A	2ZWT1A	2ZWU5A	1	3	208-230/460	60	ODP	3.7-3.2/1.6	1½″	1¼″
2ZWP7A	2ZWT2A	2ZWU6A	1½	1	115/208-230	60	ODP	17.0/9.0-8.5	1½″	1¼″
2ZWP8A	2ZWT3A	2ZWU7A	1½	3	208-230/460	60	ODP	4.4-3.9/2.0	1½″	1¼″
2ZWP9A	2ZWT4A	2ZWU8A	2	1	115/208-230	60	TEFC	16.6/9.4-8.3	1½″	1¼″
2ZWR1A	2ZWT5A	2ZWU9A	2	3	208-230/460	60	TEFC	6.0-5.8/2.9	1½″	1¼″
2ZWR2A	2ZWT6A	2ZWX1A	3	1	230	60	TEFC	12.5	2″	1½″
2ZWR3A	2ZWT7A	2ZWX2A	3	3	208-230/460	60	TEFC	8.3-7.6/3.8	2″	1½″

NOTE : ODP = Open Drip-Proof TEFC = Totally-Enclosed Fan-Cooled

ENGLISH

ESPAÑOL

FRANÇAIS

Dayton® Close-Coupled Centrifugal Pumps

Cast Iron, Bronze and 316 Stainless Steel

Pump Material

Model	Motor Adapter	Casing	Impeller	Shaft Material	Hardware	*Seals
Cast Iron Models						
2ZWN9A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP1A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP2A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP3A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP4A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP5A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP6A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP7A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP8A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWP9A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWR1A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWR2A	CI	CI	CI	304SS	Zinc Plated	Buna-N
2ZWR3A	CI	CI	CI	304SS	Zinc Plated	Buna-N
Bronze Models						
2ZWR4A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWR5A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWR6A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWR7A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWR8A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWR9A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWT1A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWT2A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWT3A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWT4A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWT5A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWT6A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
2ZWT7A	CI / BR	BR	BR	304SS	Zinc Plated	Buna-N
316 Stainless Steel Models						
2ZWT8A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWT9A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU1A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU2A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU3A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU4A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU5A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU6A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU7A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU8A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU9A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWX1A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWX2A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton

NOTE : SS=Stainless Steel BR = Bronze CI = Cast Iron
(*) Shaft Seal also contains stainless steel, ceramic, and carbon components.

Cast Iron Models 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A
Bronze Models 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A
316 Stainless Steel Models 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

Performance

Model	HP	Phase	GPM of Water at Total Feet of Head 10′	15′	20′	30′	40′	50′	60′	70′	Shut Off
Cast Iron Models											
2ZWN9A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWP1A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWP2A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWP3A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWP4A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWP5A	1	1	88	83	77	64	50	29	-	-	58
2ZWP6A	1	3	88	83	77	64	50	29	-	-	58
2ZWP7A	1½	1	115	109	104	94	81	64	40	-	67
2ZWP8A	1½	3	115	109	104	94	81	64	40	-	67
2ZWP9A	2	1	122	115	109	98	84	68	46	10	72
2ZWR1A	2	3	122	115	109	98	84	68	46	10	72
2ZWR2A	3	1	170	166	162	146	130	110	82	35	74
2ZWR3A	3	3	170	166	162	146	130	110	82	35	74
Bronze Models											
2ZWR4A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWR5A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWR6A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWR7A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWR8A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWR9A	1	1	88	83	77	64	50	29	-	-	58
2ZWT1A	1	3	88	83	77	64	50	29	-	-	58
2ZWT2A	1½	1	115	109	104	94	81	64	40	-	67
2ZWT3A	1½	3	115	109	104	94	81	64	40	-	67
2ZWT4A	2	1	122	115	109	98	84	68	46	10	72
2ZWT5A	2	3	122	115	109	98	84	68	46	10	72
2ZWT6A	3	1	170	166	162	146	130	110	82	35	74
2ZWT7A	3	3	170	166	162	146	130	110	82	35	74
316 Stainless Steel Models											
2ZWT8A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWT9A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWU1A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWU2A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWU3A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWU4A	1	1	88	83	77	64	50	29	-	-	58
2ZWU5A	1	3	88	83	77	64	50	29	-	-	58
2ZWU6A	1½	1	115	109	104	94	81	64	40	-	67
2ZWU7A	1½	3	115	109	104	94	81	64	40	-	67
2ZWU8A	2	1	122	115	109	98	84	68	46	10	72
2ZWU9A	2	3	122	115	109	98	84	68	46	10	72
2ZWX1A	3	1	170	166	162	146	130	110	82	35	74
2ZWX2A	3	3	170	166	162	146	130	110	82	35	74

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Dayton® Close-Coupled Centrifugal Pumps
Cast Iron, Bronze and 316 Stainless Steel

Dimensions (Inches)

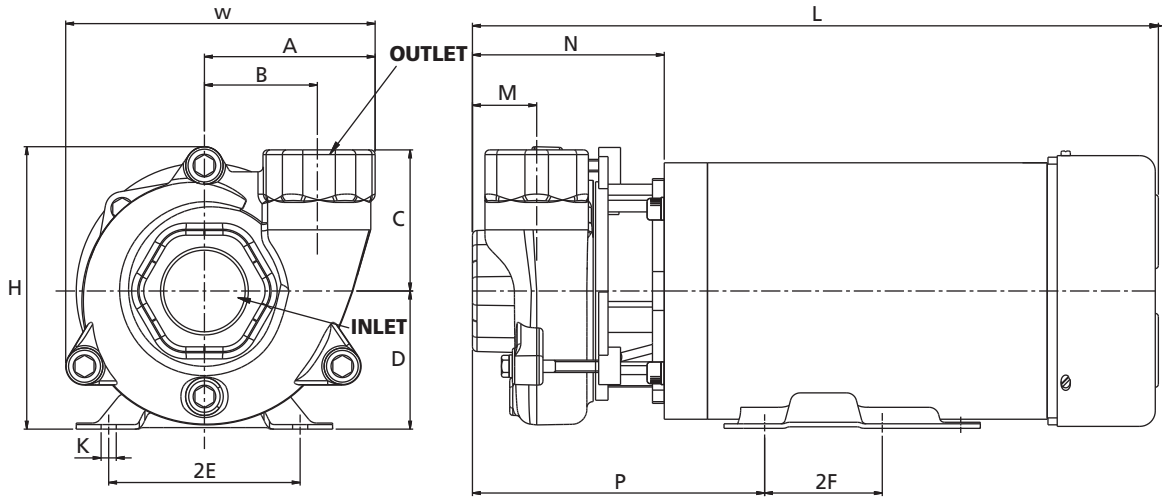


Figure 2 - Dimensions

Model	Inlet (NPT)	Outlet (NPT)	N	L†	D	2E	2F	K	P	H	B	A	C	M	W†
Cast Iron Models															
2ZWN9A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWP1A, 2ZWP2A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWP3A, 2ZWP4A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWP5A, 2ZWP6A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWP7A, 2ZWP8A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWP9A, 2ZWR1A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWR2A, 2ZWR3A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00
Bronze Models															
2ZWR4A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWR5A, 2ZWR6A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWR7A, 2ZWR8A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWR9A, 2ZWT1A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWT2A, 2ZWT3A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWT4A, 2ZWT5A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWT6A, 2ZWT7A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00
316 Stainless Steel Models															
2ZWT8A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWT9A, 2ZWU1A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWU2A, 2ZWU3A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWU4A, 2ZWU5A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWU6A, 2ZWU7A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWU8A, 2ZWU9A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWX1A, 2ZWX2A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00

NOTE : All dimensions have a tolerance of (+or-) 1/8″.
(†)This dimension may vary due to motor manufacturer's specifications.
Motor driver is subject to change without notice.

Cast Iron Models 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A
Bronze Models 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A
316 Stainless Steel Models 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

General Safety Information

Please read this before installing or operating pump. this information is provided for SAFETY and to PREVENT EQUIPMENT PROBLEMS. To help recognize this information, observe the following symbols:

NOTE: Indicates special instructions which are important but not related to hazards.

IMPORTANT: Indicates factors concerned with assembly, installation, operation, or maintenance which could result in damage to the machine or equipment if ignored.

⚠ CAUTION ***Warns about hazards that will or can cause minor personal injury or property damage if ignored.***

⚠ WARNING ***Warns about hazards that can cause severe personal injury, death, or major property damage if ignored.***

⚠ DANGER ***Warns about hazards that will cause serious personal injury, death, or major property damage if ignored.***

1. Most accidents can be avoided by using COMMON SENSE.

⚠ CAUTION ***Do not wear loose clothing that may-become entangled in the impeller or other moving parts.***
Always wear appropriate safety gear, such as safety glasses, when working on the pump or piping.

⚠ CAUTION ***Pumps build up heat and pressure during operation. Allow time for pumps to cool before handling or servicing.***

2. Only qualified personnel should install, operate, and repair pump.

⚠ CAUTION ***Keep clear of suction and discharge openings. Do not insert fingers in pump with power connected.***

⚠ DANGER ***Do not pump hazardous materials (flammable, caustic,etc.) unless the pump is specifically designed and designated to handle them.***

3. Make sure lifting handles are securely fastened each time before lifting.
4. Do not operate pump without safety devices in place. Always replace safety devices that have been removed during service or repair.
5. Do not exceed manufacturer's recommendation for maximum performance, as this could cause the motor to overheat.
6. Secure the pump in its operating position so it can not tip over, fall, or slide.

⚠ DANGER ***These pumps are not approved for use in swimming pools, recreational water installations, decorative fountains, or any installation where human contact with the pumped fluid is common.***

7. Operation against a closed discharge valve will cause premature bearing and seal failure on any pump, and on self-priming pumps the heat build up may cause the generation of steam with resulting of dangerous pressures. It is recommended that a high case temperature switch or pressure relief valve be installed on the pump body or between the pump body and any valves.

⚠ WARNING ***To reduce risk of electrical shock, pump must be properly grounded in accordance with the United States National Electric Code (NEC), or the Canadian Electrical Code (CEC) and all applicable state, and local codes and ordinances. Improper grounding voids warranty.***

⚠ WARNING ***To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.***

8. Any wiring of pumps should be performed by a qualified electrician.

⚠ WARNING ***To reduce risk of electrical shock, all wiring and junction connections should be made per the United States National Electric Code (NEC), or the Canadian Electrical Code (CEC) and applicable state or province and local codes. Requirements may vary depending on usage and location.***

9. If using hose do not block or restrict discharge hose, as discharge hose may whip under pressure.

⚠ WARNING ***This pump is designed to handle materials which could cause illness or diease through direct exposure. Wear adequate protective clothing when working on the pump or piping.***

10. Products returned must be cleaned, sanitized, or decontaminated as necessary prior to shipment, to insure that employees will not be exposed to health hazards in handling said materials. All applicable laws and regulations shall apply.

11. Bronze/brass and bronze/brass fitted pumps may contain lead levels higher than considered safe for portable water systems. Various government agencies have determined that leaded copper alloys should not be used in portable water applications. For non-leaded copper alloy materials of construction, please contact factory.

Dayton Electric Mfg. Co. is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.

ENGLISH

Dayton®

Dayton® Close-Coupled Centrifugal Pumps
Cast Iron, Bronze and 316 Stainless Steel

Unpacking
Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the carrier that delivered the pump. If the manual is removed from the packaging, do not lose or misplace.

Storage
Short Term- Pumps are manufactured for efficient performance following short inoperative periods in storage. For best results, pumps can be retained in storage, as factory assembled, in a dry atmosphere with constant temperatures for up to six (6) months.

Long Term- For storage of six (6) months, to twenty-four (24) months, the units should be stored in a temperature controlled area, a roofed-over walled enclosure that provides protection from the elements (rain, snow, wind-blown dust, etc.), and whose temperature can be maintained between +40° F and +120° F. If extended high humidity is expected to be a problem, all exposed parts should be inspected before storage and all surfaces that have the paint scratched, damaged, or worn should be recoated with a water base, air dry enamel paint. All surfaces should then be sprayed with a rust-inhibiting oil.

Pump should be stored in its original shipping container. On initial start up, rotate impeller by hand to assure seal and impeller rotate freely.

If it is required that the pump be installed and tested before the long term storage begins, such installation will be allowed provided:

1. The pump is not installed for more than one (1) month.
2. Immediately upon satisfactory completion of the test, the pump is removed, thoroughly dried, repacked in the original shipping container, and placed in a temperature controlled storage area.

Installation
PIPING
Locate pump as close to the fluid source as possible, thus making the suction line short and direct as possible. Attach suction line piping to inlet of pump and discharge piping to outlet of pump. A pipe tee should be used on the pump discharge to allow filling the case with liquid before pump is started. The pump will not prime unless filled with liquid, or the mechanical seal will be damaged. Avoid using looped section of pipe or fittings which might permit air pockets to form. Use pipe sealant to insure airtight pipe connections. Support the piping independently of the pump to avoid excessive stresses on the pump casing, which could cause impeller misalignment and possible pump failure.

It is recommended that both a union and a gate valve (not supplied) be installed on the discharge side of the pump for service convenience.

⚠ CAUTION ***Do not use a globe valve or other restricting type of valve at the discharge as they will restrict the capacity of the pump.***

⚠ WARNING ***This unit is not weatherproof nor is it able to be submersed in water or located in other potentially wet locations.***

The motor is designed to be used in a clean dry location with access to an adequate supply of cooling air. For outdoor installations, motor must be protected by a cover that does not block airflow.

ELECTRICAL CONNECTIONS
1. Motor wiring should conform to national, state and local electrical codes.

2. Use wire of adequate size to prevent voltage drop.

3. Pump should be on a branch or separate circuit, fused or circuit breaker, protected, with a manual disconnect.

4. Connect the electrical supply from the switch to the motor terminals, following the wiring diagram on the motor nameplate or terminal coverplate.

NOTE: Be sure that the connections to the motor terminals correspond with the voltage to be applied.

Check wiring and fuse charts before connecting wires to service line. Make sure the voltage and frequency of the electrical current supply agrees with that stamped on the motor nameplate. If in doubt, check with power company.

Some pumps are equipped with three phase motors. Three phase motors require magnetic starters, and can run in either direction, depending on how they are connected to the power supply.

GROUNDING MOTOR
Wiring to this pump must be installed and maintained in accordance with the National Electrical code or your State and local electrical code.

It is required that a permanent ground connection be made to the unit using a conductor of appropriate size from a metal underground water pipe or a grounded lead in the service panel. **DO NOT** connect to electric power supply until unit is permanently grounded. Connect the ground wire to the approved ground and then connect to the terminal provided.

Cast Iron Models 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A
Bronze Models 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A
316 Stainless Steel Models 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

Pre-operation

CHECK PUMP ROTATION

THREE PHASE - The rotation is indicated by an arrow on the casing. The pump should not be operated backwards or in reverse rotation. Momentarily apply power, while viewing the rear of the motor (opposite the pump end), the motor shaft should be rotating clockwise. If the motor operates in the wrong rotation, interchange any two of the lead wires and the correct rotation will result.

INCORRECT ROTATION

SINGLE PHASE - In the unlikely event that the rotation is incorrect for a single-phase pump, contact Dayton Electric Mfg. Co.

FLOODED SUCTION PRIMING

This method of priming a pump is relatively simple. The liquid source is located above the pump and all that is necessary to prime the pump is to open the air vent valve or plug in the pump casing and to crack the gate valve in the suction line. The suction line and pump should be filled slowly until a steady stream of liquid is observed flowing from the air vent. After the pump is operating, it is recommended that the air vent valve or plug be opened again to insure that all air has been expelled from the pump casing.

⚠ CAUTION ***DO NOT start pump until it has been filled with water.***

⚠ CAUTION ***Centrifugal pumps should never be started or run dry. Operating a pump dry will cause scoring of the mechanical seal, resulting in premature seal failure. To prevent the pump from being run dry, it should be primed before starting.***

STARTING

For initial starting, the gate valve in the discharge line should be closed, and opened gradually as the motor approaches full speed, usually in five to ten seconds. After the pump has once been in operation so that the discharge line has been completely filled, it is then unnecessary to close the gate valve in starting.

SEASONAL SERVICE

To take out of service;

1. Drain the liquid from the pump to prevent freezing and damage to the pump body. It is recommended that a good rust inhibitor be put into the liquid end to prevent excessive corrosion. Keep the motor dry and covered.
2. To drain, remove the drain plug which is located below the inlet of the pump. Drain the inlet pipe to a point below the frost line. All other pipes, which may be exposed to freezing temperatures, should also be drained.
3. Remove the priming plug. This will help the pump body to drain by permitting air to enter the case.

To Place Pump Back into Service:

1. Replace all drain plugs previously removed, using pipe joint compound on all male threads.
2. Make sure suction and discharge lines have been reconnected and tightened.
3. Check to be certain that the pump shaft turns freely.
4. Verify with name plate that motor has been configured for your system voltage requirements.
5. Prime and start.

Maintenance

⚠ WARNING ***Make certain that the unit is disconnected from the power source before attempting to service or remove any components!***

REMOVAL OF OLD SEAL ASSEMBLY

Should the mechanical seal assembly (Ref. NO.4 & 5) require repair, proceed as follows and refer to Figures No.3 thru 7.

IMPORTANT: Always replace both the seal seat and seal head to ensure proper mating of components!

1. Remove bolts (Ref. No. 11) connecting the casing (Ref. No.9) to the adapter (Ref. No.2).
2. Remove the casing.

⚠ CAUTION ***Care should be taken not to pinch or "shave" the o-ring gasket (Ref. No.8) between the adapter and the casing.***

NOTE: Motor shaft must be held in place to remove impeller. Back of the motor has slot in shaft (use large screwdriver to hold) Impeller (Ref. No.7) unscrews CCW when looking at the front of the pump.

IMPORTANT: Care should be taken to ensure that the same number and thickness of shim washers (Ref. No.6) are replaced behind the impeller as were removed. The shim washers are located directly behind the impeller and become loose as the impeller is removed.

3. The seal head (Ref. No.5) can now be pulled from the shaft (see Figure 4).
4. Remove the motor adapter (Ref. No. 2) from the motor by removing the adapter bolts (Ref. No.3).

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Dayton® Close-Coupled Centrifugal Pumps
Cast Iron, Bronze and 316 Stainless Steel

Maintenance (Continued)

5. Use a wooden dowel to push out the seal seat (Ref. No.4) from the adapter (Ref. No.2) (see Figure 5).

INSTALLATION OF NEW SEAL ASSEMBLY

⚠ CAUTION ***The precision carbon/ceramic faces on the mechanical seal are easily damaged. Handle your repair seal carefully. Do not touch the carbon/ceramic seal faces.***

IMPORTANT: Be sure that shaft shoulder does not damage carbon face.

1. Thoroughly clean all surfaces of the seal seat cavity in adapter (Ref. No.2).
2. Using a clean cloth, wipe the shaft and shaft sleeve and make certain that they are perfectly clean.

NOTE: Inspect the motor shaft for scratches or spiral grooves. If they exist, replace motor.

3. Wet the rubber portion of the new seal seat (Ref. No.4) with a light coating of soapy water. While wearing clean gloves or using a clean light rag, press seal seat squarely into adapter recess. Use the cardboard washer (usually supplied with new seal) to place over the polished surface and use a piece of pipe or dowel rod to press in firmly but gently. Avoid scratching the white ceramic face (see Figure 6).
4. Dispose of cardboard washer. Check again to see that ceramic surface is free of dirt and all other foreign particles and that it has not been scratched or damaged.
5. Wet the inside rubber portion of the new seal head (Ref. No.5) with a light coating of soapy water. Slide head onto the motor shaft with the sealing surface (carbon) facing the seal seat (see Figure 7). This completes seal installation.

NOTE: A short "run-in" period may be necessary to provide completely leak-proof seal operation.

6. Screw impeller (Ref. No.7) onto shaft. Use screwdriver slot at rear of motor shaft (opposite the threaded end) to tighten impeller.

NOTE: It may be necessary to remove plug in motor end cap to expose slot. If removed, be sure to reinstall plug AFTER pump is completely assembled.

7. By replacing the original shims that came with the pump, the impeller height should be properly set. The chart accompanying Figure 3 gives the correct adapter to motor height dimension for optimum pump performance. After installing, check to see if shaft turns freely by spinning impeller. If rubbing or binding is found, remove impeller and add a shim (Ref. No.6) to shaft, then recheck. Repeat procedure until all rubbing is eliminated.
8. Place o-ring (Ref. No.8) on adapter mounting flange. Attach casing using bolts (Ref. No. 11), being careful not to pinch or "shave" o-ring. As the casing is being tightened, periodically spin impeller to check for interference with casing.

⚠ CAUTION ***Seal will produce minor drag when spinning motor shaft, but rubbing anywhere else must be eliminated! Otherwise, damage to pump and/or motor may occur.***

IMPELLER SHIM ADJUSTMENT

Model	Position "A"
2ZWR4A, 2ZWN9A, 2ZWT8A	0.634”-0.674”
2ZWR5A, 2ZWP1A, 2ZWT9A	0.742”-0.782”
2ZWR6A, 2ZWP2A, 2ZWU1A	
2ZWR7A, 2ZWR8A, 2ZWP3A, 2ZWP4A, 2ZWU2A, 2ZWU3A	0.755”-0.795”
2ZWR9A, 2ZWP5A, 2ZWU4A	0.873”-0.913”
2ZWT1A, 2ZWP6A, 2ZWU5A	
2ZWT2A, 2ZWT3A, 2ZWP7A, 2ZWP8A, 2ZWU6A, 2ZWU7A	0.874”-0.914”

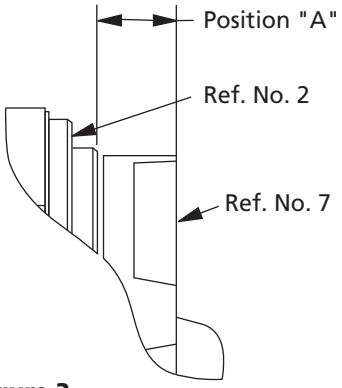


Figure 3

Cast Iron Models 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A
Bronze Models 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A
316 Stainless Steel Models 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

Seal Assembly Removal and Installation (Figures 4 thru 7)

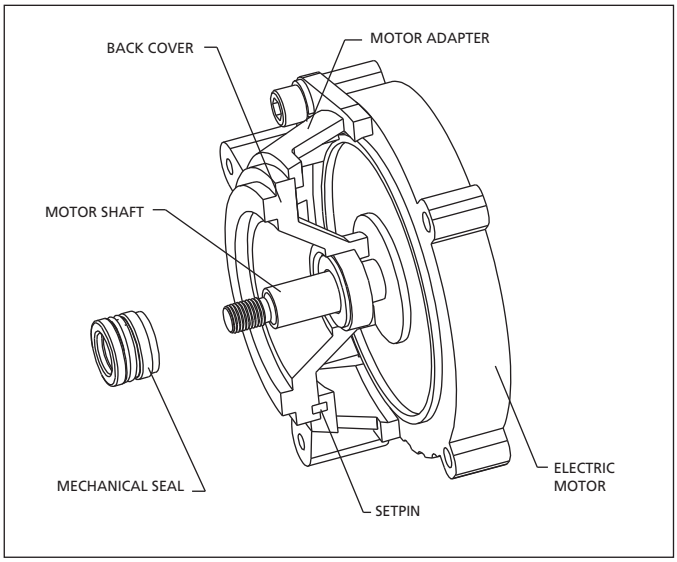


Figure 4 - Seal Removal

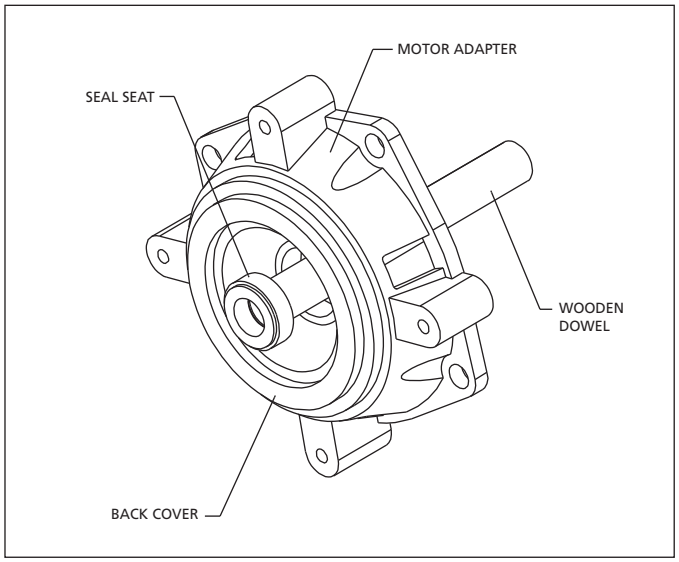


Figure 5 - Seal Seat Removal

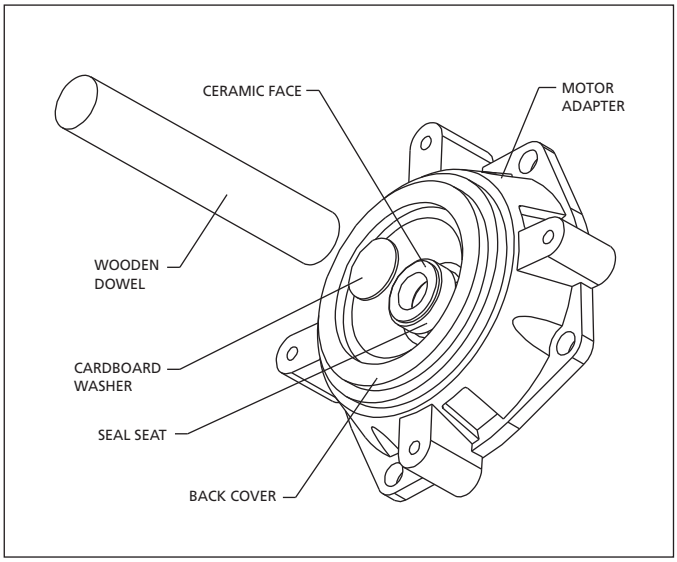


Figure 6 - Seal Seat Assembly

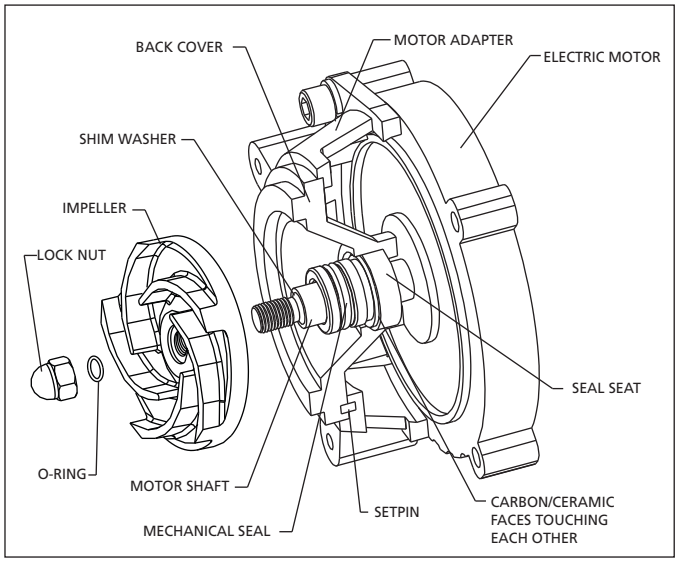


Figure 7 - Seal and Impeller Assembly

Dayton® Close-Coupled Centrifugal Pumps
Cast Iron, Bronze and 316 Stainless Steel

Troubleshooting Chart

Symptom	Possible Causes (s)	Corrective Action
Pump runs but no fluid	1. Faulty suction piping 2. Pump located too far from fluid source 3. Gate valve closed 4. Clogged strainer 5. Fouled foot valve 6. Discharge height too great, or long	1. Replace piping 2. Relocate pump 3. Open valve 4. Clean or replace strainer 5. Clean or replace valve 6. Lower the discharge point, shorten piping
Pump will not prime or retain prime after operating	1. Air leak in suction line 2. Clogged foot valve or strainer 3. Leaking foot valve	1. Repair or replace 2. Clean or replace 3. Repair or replace foot valve
Flow rate is low	1. Piping is fouled or damaged 2. Clogged impeller or worn impeller 3. Discharge line restricted or undersized 4. Plumbing restriction	1. Clean or replace 2. Clean or replace 3. Flush out piping or replace 4. Remove restrictions
Pump starts and stops pumping	1. Fouled impeller 2. Faulty mechanical seal 3. Leak in suction line 4. Leak in foot valve	1. Clean impeller and pump 2. Replace seal 3. Repair or replace suction line 4. Repair or replace foot valve
Excessive noise while pump in operation	1. Pump not secured to firm foundation 2. Piping not supported to relieve any strain on pump assembly 3. Restricted suction line	1. Secure pump properly 2. Make necessary adjustments 3. Clean and correct suction line
Liquid drips from point where shaft enters the pump casing, when pump is full of liquid	1. Damaged mechanical seal	1. Replace (See mechanical seal replacement)

For Repair Parts, call 1-800-Grainger

24 hours a day – 365 days a year

Please provide following information:
-Model number
-Serial number (if any)
-Part description and number as shown in parts list

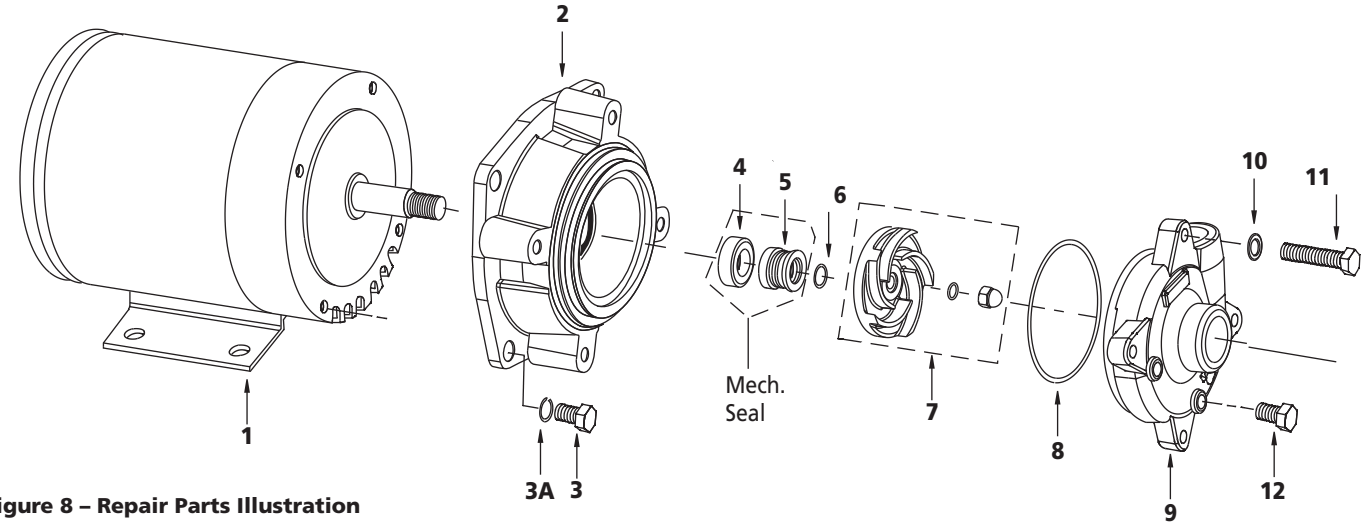


Figure 8 – Repair Parts Illustration

Repair Parts List for Cast Iron Pumps 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A

Ref. No.	Description	Part Number for Models: 2ZWN9A	2ZWP1A 2ZWP2A	2ZWP3A 2ZWP4A	2ZWP5A 2ZWP6A	2ZWP7A 2ZWP8A	2ZWP9A 2ZWR1A	2ZWR2A 2ZWR3A	
1	Motor***	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Pump Adaptor	PPL2305CG	PPL2306CG	PPL2306CG	PPL2307CG	PPL2307CG	PPL2308CG	PPL2308CG	1
3	3/8-16 x 1" bolt, Zinc plated	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	3/8-16 x 3/4" bolt, Zinc plated	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	3/8" Lockwasher, Zinc plated	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Buna-N mechanical seal & seat assy (std.)	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	Option seals available**								
	†Viton mechanical seal & seat assy	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	†Silicon carbide seal & seat assy	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	Impeller shim kit	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Impeller with Lock Nut & O-Ring	PPL2201CGG	PPL2202CGG	PPL2203CGG	PPL2204CGG	PPL2205CGG	PPL2206CGG	PPL2207CGG	1
8	Buna-N O-ring	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
	†Viton O-ring	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
9	Pump casing	PPL2101CG	PPL2102CG	PPL2102CG	PPL2103CG	PPL2103CG	PPL2104CG	PPL2105CG	1
10	Lockwasher, Steel, Zinc plated*	PPL3201G	PPL3201G	PPL3201G	PPL3201G	PPL3201G	-	-	4
	Lockwasher, Steel, Zinc plated*	-	-	-	-	-	PPL3203G	PPL3203G	3
11	5/16-18 Hex head bolt, Steel, Zinc plated*	PPL3104G	PPL3104G	PPL3104G	PPL3106G	PPL3106G	N/A	N/A	4
	7/16-14 Long hex head bolt, Steel, Zinc plated*	N/A	N/A	N/A	N/A	N/A	PPL3112G	PPL3114G	2
	7/16-14 Short hex head bolt, Steel, Zinc plated*	N/A	N/A	N/A	N/A	N/A	PPL3108G	PPL3110G	1
12	Pipe plug, Zinc plated*	PPL3501G	PPL3501G	PPL3501G	PPL3501G	PPL3501G	-	-	2
	Pipe plug, Zinc plated*	-	-	-	-	-	PPL3504G	PPL3504G	1

(*) Standard hardware item, available locally.
(†) Optional.
(***) Driver is subject to change without notice; see label on driver for actual specifications.
SS= Stainless Steel
(**) **Note:** Viton and Buna-N Seal have carbon on ceramic faces.
Silicon carbide seals have Viton bellows.
All seals have 316 SS metal components.

For Repair Parts, call 1-800-Grainger

24 hours a day – 365 days a year

Please provide following information:
-Model number
-Serial number (if any)
-Part description and number as shown in parts list

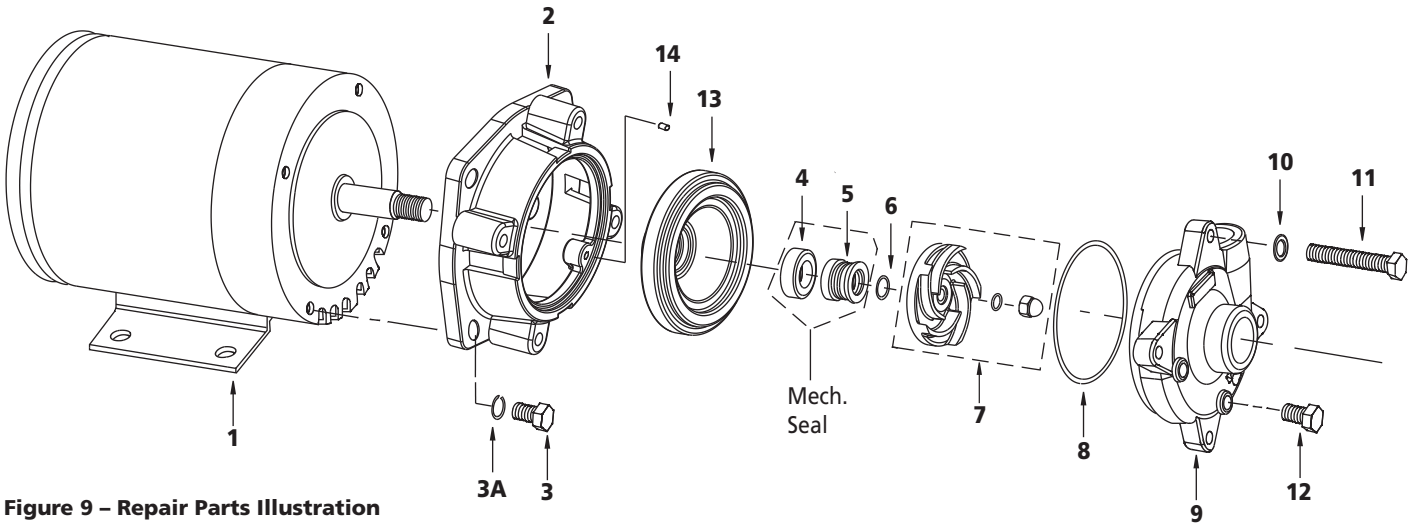


Figure 9 – Repair Parts Illustration

Repair Parts List for Bronze Pumps 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A

Ref. No.	Description	Part Number for Models: 2ZWR4A	2ZWR5A 2ZWR6A	2ZWR7A 2ZWR8A	2ZWR9A 2ZWT1A	2ZWT2A 2ZWT3A	2ZWT4A 2ZWT5A	2ZWT6A 2ZWT7A	Qty.
1	Motor***	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Pump Adaptor	PPL2309CG	PPL2310CG	PPL2310CG	PPL2311CG	PPL2311CG	PPL2312CG	PPL2312CG	1
3	3/8-16 x 1" bolt, Zinc plated	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	3/8-16 x 3/4" bolt, Zinc plated	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	3/8" Lockwasher, Zinc plated	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Buna-N mechanical seal & seat assy (std.)	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	Option seals available**								
	†Viton mechanical seal & seat assy	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	†Silicon carbide seal & seat assy	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	Impeller shim kit	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Impeller with Lock Nut & O-Ring	PPL2201BGG	PPL2202BGG	PPL2203BGG	PPL2204BGG	PPL2205BGG	PPL2206BGG	PPL2207BGG	1
8	Buna-N O-ring	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
	†Viton O-ring	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
9	Pump casing	PPL2101BG	PPL2102BG	PPL2102BG	PPL2103BG	PPL2103BG	PPL2104BG	PPL2105BG	1
10	Lockwasher, Steel, Zinc plated*	PPL3201G	PPL3201G	PPL3201G	PPL3201G	PPL3201G	-	-	4
	Lockwasher, Steel, Zinc plated*	-	-	-	-	-	PPL3203G	PPL3203G	3
11	5/16-18 Hex head bolt, Steel, Zinc plated*	PPL3104G	PPL3104G	PPL3104G	PPL3106G	PPL3106G	N/A	N/A	4
	7/16-14 Long hex head bolt, Steel, Zinc plated*	N/A	N/A	N/A	N/A	N/A	PPL3112G	PPL3114G	2
	7/16-14 Short hex head bolt, Steel, Zinc plated*	N/A	N/A	N/A	N/A	N/A	PPL3108G	PPL3110G	1
12	Pipe plug, Brass*	PPL3503G	PPL3503G	PPL3503G	PPL3503G	PPL3503G	-	-	2
	Pipe plug, Brass*	-	-	-	-	-	PPL3506G	PPL3506G	1
13	Back cover	PPL2315BG	PPL2316BG	PPL2316BG	PPL2317BG	PPL2317BG	PPL2318BG	PPL2318BG	1
14	Roll pin	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	2

(*) Standard hardware item, available locally.
(†) Optional.
(***) Driver is subject to change without notice; see label on driver for actual specifications.
SS= Stainless Steel
(**) **Note:** Viton and Buna-N Seal have carbon on ceramic faces.
Silicon carbide seals have Viton bellows.
All seals have 316 SS metal components.

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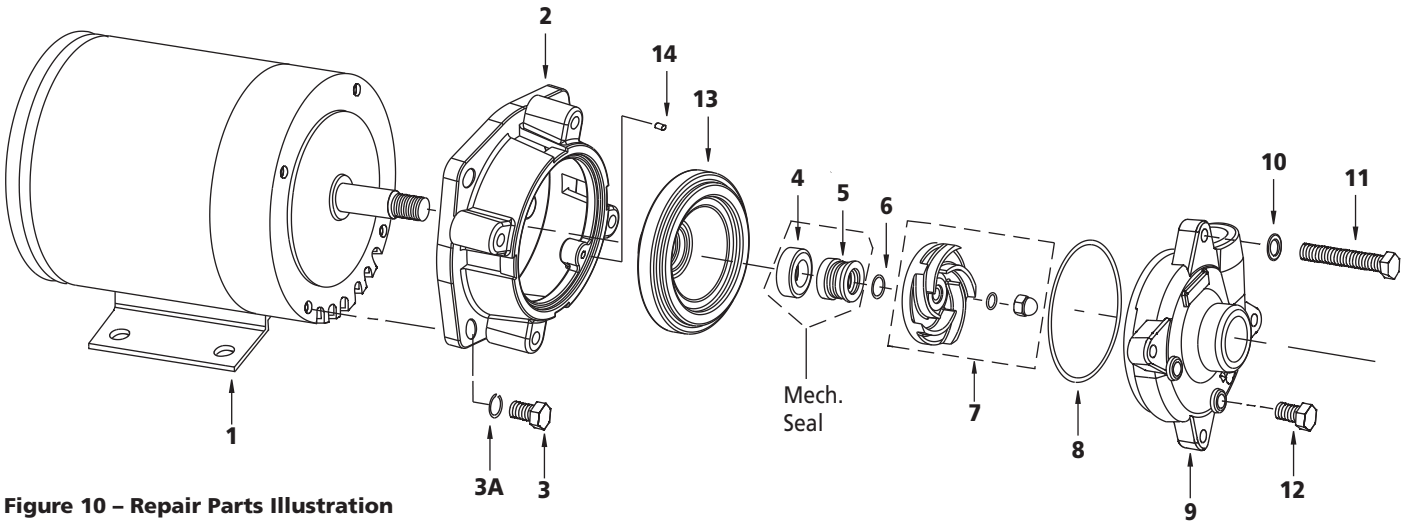


Figure 10 – Repair Parts Illustration

Repair Parts List for 316 Stainless Steel Models 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

Ref. No.	Description	Part Number for Models: 2ZWT8A	2ZWT9A 2ZWU1A	2ZWU2A 2ZWU3A	2ZWU4A 2ZWU5A	2ZWU6A 2ZWU7A	2ZWU8A 2ZWU9A	2ZWX1A 2ZWX2A	Qty.
1	Motor***	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Pump Adaptor	PPL2309CG	PPL2310CG	PPL2310CG	PPL2311CG	PPL2311CG	PPL2312CG	PPL2312CG	1
3	3/8-16 x 1" bolt, Zinc plated	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	3/8-16 x 3/4" bolt, Zinc plated	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	3/8" Lockwasher, Zinc plated	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Viton mechanical seal & seat assy (std.)	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	Option seals available**								
	†Buna-N mechanical seal & seat assy	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	†Silicon carbide seal & seat assy	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	Impeller shim kit	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Impeller with Lock Nut & O-Ring	PPL2201SGG	PPL2202SGG	PPL2203SGG	PPL2204SGG	PPL2205SGG	PPL2206SGG	PPL2207SGG	1
8	Viton O-ring	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
	†Buna-N O-ring	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
9	Pump casing	PPL2101SG	PPL2102SG	PPL2102SG	PPL2103SG	PPL2103SG	PPL2104SG	PPL2105SG	1
10	Lockwasher, 316 SS*	PPL3202G	PPL3202G	PPL3202G	PPL3202G	PPL3202G	-	-	4
	Lockwasher, 316 SS*	-	-	-	-	-	PPL3204G	PPL3204G	3
11	5/16-18 Hex head bolt, 316 SS*	PPL3105G	PPL3105G	PPL3105G	PPL3107G	PPL3107G	N/A	N/A	4
	7/16-14 Long hex head bolt, 316 SS*	N/A	N/A	N/A	N/A	N/A	PPL3113G	PPL3115G	2
	7/16-14 Short hex head bolt, 316 SS*	N/A	N/A	N/A	N/A	N/A	PPL3109G	PPL3111G	1
12	Pipe plug, 316 SS	PPL3502G	PPL3502G	PPL3502G	PPL3502G	PPL3502G	-	-	2
		-	-	-	-	-	PPL3505G	PPL3505G	1
13	Back cover	PPL2315SG	PPL2316SG	PPL2316SG	PPL2317SG	PPL2317SG	PPL2318SG	PPL2318SG	1
14	Roll pin	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	2

(*) Standard hardware item, available locally.
(†) Optional.
(***) Driver is subject to change without notice; see label on driver for actual specifications.
SS= Stainless Steel
(**) **Note:** Viton and Buna-N Seal have carbon on ceramic faces.
Silicon carbide seals have Viton bellows.
All seals have 316 SS metal components.

Notes

Notes

Dayton® Close-Coupled Centrifugal Pumps
Cast Iron, Bronze and 316 Stainless Steel

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. *DAYTON® CLOSE-COUPLED CENTRIFUGAL PUMP, MODELS COVERED IN THIS MANUAL, ARE WARRANTED BY DAYTON ELECTRIC MFG. CO. (DAYTON) TO THE ORIGINAL USER AGAINST DEFECTS IN WORKMANSHIP OR MATERIALS UNDER NORMAL USE FOR ONE YEAR AFTER DATE OF PURCHASE. ANY PART WHICH IS DETERMINED TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP AND RETURNED TO AN AUTHORIZED SERVICE LOCATION, AS DAYTON DESIGNATES, SHIPPING COSTS PREPAID, WILL BE, AS THE EXCLUSIVE REMEDY, REPAIRED OR REPLACED AT DAYTON'S OPTION. FOR LIMITED WARRANTY CLAIM PROCEDURES, SEE "PROMPT DISPOSITION" BELOW. THIS LIMITED WARRANTY GIVES PURCHASERS SPECIFIC LEGAL RIGHTS WHICH VARY FROM JURISDICTION TO JURISDICTION.*

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Prompt Disposition. *A good faith effort will be made for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom the product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date, and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.*

Manufactured for Dayton Electric Mfg. Co., 100 Grainger Parkway, Lake Forest, Illinois 60045 U.S.A.

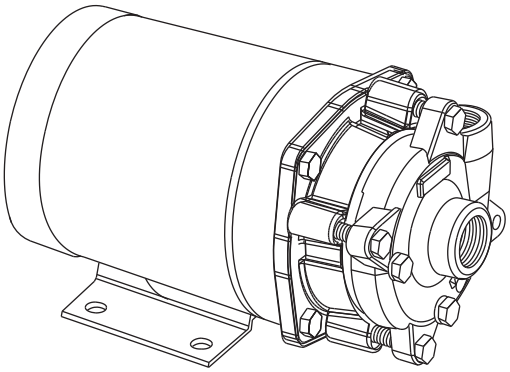
Por favor lea y guarde estas instrucciones. ***Lea cuidadosamente antes de tratar de montar, instalar, operar o hacer servicio del producto descrito. Protege a sí mismo y a los demás al observar todas las instrucciones de seguridad. ¡El no cumplir con las instrucciones puede resultar en herida personal y/o daño a propiedad! Guarde las instrucciones para referencia en el futuro.***

Dayton® Bombas de Centrífugo Acoplamiento Estrecho

Hierro Fundido, Bronce y de Acero inoxidable 316

Descripción

Las Bombas Dayton Centrífugo Acoplamiento Estrecho de Hierro Fundido, Bronce y de Acero inoxidable 316 funcionan sin parar, produciendo altas cantidades de flujo bajo condiciones de salto bajo. Están diseñadas para la circulación continua de baja presión y transferencia de líquidos no-flamables, utilidades, alimento de calderas, transferencia general, filtración, torres de enfriamiento, devolución de condensado, aplicaciones marítimas, fuentes, reforzadoras, circulación de agua, riego, sistemas de aspersión, servicio de bomba polea, procesamiento químico, aplicaciones agresivas de líquidos y otros fines para bombas compatibles con materiales de componentes de bombas donde no se requiere altura de succión ni cebado automático.



Dibujo 1

Especificaciones

Temperatura..... 40ºF hasta 200ºF máx.
Presión máx. de entrada..... 200 (1379)
Impulsor..... Semi Abierto
Pintura..... Esmalte secado por aire
Cierre..... Cierre de carbono/cerámico mecánico
Velocidad..... 3450 RPM
Motor..... Abierto protegido contra goteo/Construcción totalmente encerrada y enfriada por ventilador (Estructura 56J) y aprobadas para operación continua.
Fase Única..... Inicio de capacitador. Incluye protección de sobrecarga en motor.
Tres Fases..... Se debe instalarla con arrancador magnético que ofrece protección completa de 3 clavijas.

ESPAÑOL

Modelos de Hierro Fundido	Modelos de Bronce	Modelos de Acero Inoxidable 316	Detalles de Motor					Amps de moto de carga completa	Tamaño de abertura	
			HP	Fase	Vatios	Hz	Encerrado		Succión	Descarga
2ZWN9A	2ZWR4A	2ZWT8A	1/3	1	115/230	60	ODP	7.5/3.8	1″	3/4″
2ZWP1A	2ZWR5A	2ZWT9A	1/2	1	115/230	60	ODP	8.4/4.8	1¼″	1″
2ZWP2A	2ZWR6A	2ZWU1A	1/2	3	208-230/460	60	ODP	1.8-1.7/0.9	1¼″	1″
2ZWP3A	2ZWR7A	2ZWU2A	3/4	1	115/230	60	ODP	11.3/5.6	1¼″	1″
2ZWP4A	2ZWR8A	2ZWU3A	3/4	3	208-230/460	60	ODP	2.7-2.5/1.2	1¼″	1″
2ZWP5A	2ZWR9A	2ZWU4A	1	1	115/230	60	ODP	14.4/7.2	1½″	1¼″
2ZWP6A	2ZWT1A	2ZWU5A	1	3	208-230/460	60	ODP	3.7-3.2/1.6	1½″	1¼″
2ZWP7A	2ZWT2A	2ZWU6A	1½	1	115/208-230	60	ODP	17.0/9.0-8.5	1½″	1¼″
2ZWP8A	2ZWT3A	2ZWU7A	1½	3	208-230/460	60	ODP	4.4-3.9/2.0	1½″	1¼″
2ZWP9A	2ZWT4A	2ZWU8A	2	1	115/208-230	60	TEFC	16.6/9.4-8.3	1½″	1¼″
2ZWR1A	2ZWT5A	2ZWU9A	2	3	208-230/460	60	TEFC	6.0-5.8/2.9	1½″	1¼″
2ZWR2A	2ZWT6A	2ZWX1A	3	1	230	60	TEFC	12.5	2″	1½″
2ZWR3A	2ZWT7A	2ZWX2A	3	3	208-230/460	60	TEFC	8.3-7.6/3.8	2″	1½″

Apunte: OPD = Abierto protegido contra goteo TEFC = Construcción totalmente encerrada y enfriada por ventilador

Dayton® Bombas de Centrífugo Acoplamiento Estrecho

Hierro Fundido, Bronce y de Acero inoxidable 316

Materia de bomba

Modelo	Adaptador de motor	Caja	Impulsor	Materia de eje	Hardware	*Cierre
Modelo de Hierro Fundido						
2ZWN9A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP1A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP2A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP3A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP4A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP5A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP6A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP7A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP8A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWP9A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWR1A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWR2A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
2ZWR3A	CI	CI	CI	304SS	Plancha de zinc	Buna-N
Modelo de Bronce						
2ZWR4A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWR5A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWR6A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWR7A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWR8A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWR9A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWT1A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWT2A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWT3A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWT4A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWT5A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWT6A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
2ZWT7A	CI / BR	BR	BR	304SS	Plancha de zinc	Buna-N
Modelo de Acero Inoxidable 316						
2ZWT8A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWT9A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU1A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU2A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU3A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU4A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU5A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU6A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU7A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU8A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU9A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWX1A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWX2A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton

Apunte: SS = Acero Inoxidable BR = Bronce CI = Hierro Fundido
(*) El cierre de eje también contiene acero inoxidable, cerámica, y componentes de carbono.

ESPAÑOL

Modelos de Hierro Fundido 2ZWN9A, 2ZWP1A hasta 2ZWP9A, 2ZWR1A hasta 2ZWR3A
Modelos de Bronce 2ZWR4A hasta 2ZWR9A, 2ZWT1A hasta 2ZWT7A
Modelos de Acero Inoxidable 316 2ZWT8A, 2ZWT9A, 2ZWU1A hasta 2ZWU9A, 2ZWX1A Y 2ZWX2A

Rendimiento

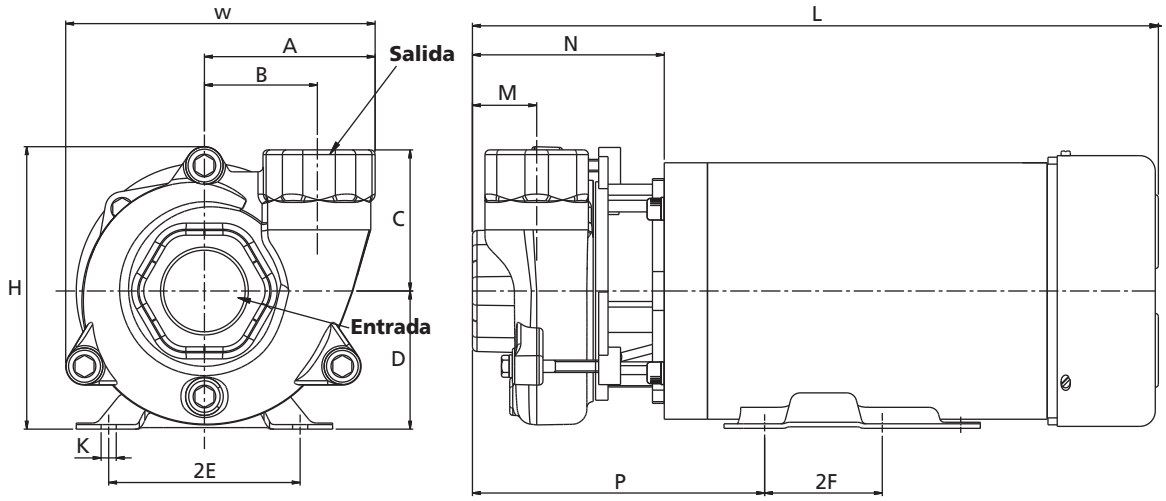
Modelo	HP	Fase	GPM de Agua @ Totel Pies de Jefe 10′	15′	20′	30′	40′	50′	60′	70′	Cabeza de apagado
Modelo de Hierro Fundido											
2ZWN9A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWP1A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWP2A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWP3A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWP4A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWP5A	1	1	88	83	77	64	50	29	-	-	58
2ZWP6A	1	3	88	83	77	64	50	29	-	-	58
2ZWP7A	1½	1	115	109	104	94	81	64	40	-	67
2ZWP8A	1½	3	115	109	104	94	81	64	40	-	67
2ZWP9A	2	1	122	115	109	98	84	68	46	10	72
2ZWR1A	2	3	122	115	109	98	84	68	46	10	72
2ZWR2A	3	1	170	166	162	146	130	110	82	35	74
2ZWR3A	3	3	170	166	162	146	130	110	82	35	74
Modelo de Bronce											
2ZWR4A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWR5A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWR6A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWR7A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWR8A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWR9A	1	1	88	83	77	64	50	29	-	-	58
2ZWT1A	1	3	88	83	77	64	50	29	-	-	58
2ZWT2A	1½	1	115	109	104	94	81	64	40	-	67
2ZWT3A	1½	3	115	109	104	94	81	64	40	-	67
2ZWT4A	2	1	122	115	109	98	84	68	46	10	72
2ZWT5A	2	3	122	115	109	98	84	68	46	10	72
2ZWT6A	3	1	170	166	162	146	130	110	82	35	74
2ZWT7A	3	3	170	166	162	146	130	110	82	35	74
Modelo de Acero Inoxidable 316											
2ZWT8A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWT9A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWU1A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWU2A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWU3A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWU4A	1	1	88	83	77	64	50	29	-	-	58
2ZWU5A	1	3	88	83	77	64	50	29	-	-	58
2ZWU6A	1½	1	115	109	104	94	81	64	40	-	67
2ZWU7A	1½	3	115	109	104	94	81	64	40	-	67
2ZWU8A	2	1	122	115	109	98	84	68	46	10	72
2ZWU9A	2	3	122	115	109	98	84	68	46	10	72
2ZWX1A	3	1	170	166	162	146	130	110	82	35	74
2ZWX2A	3	3	170	166	162	146	130	110	82	35	74

ESPAÑOL

Dayton® Bombas de Centrífugo Acoplamiento Estrecho

Hierro Fundido, Bronce y de Acero inoxidable 316

Dimensiones (Pulgadas)



Dibujo 2 - Dimensiones

Modelo	Entrada (NPT)	Salida (NPT)	N	L†	D	2E	2F	K	P	H	B	A	C	M	W†
Modelo de Hierro Fundido															
2ZWN9A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWP1A, 2ZWP2A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWP3A, 2ZWP4A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWP5A, 2ZWP6A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWP7A, 2ZWP8A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWP9A, 2ZWR1A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWR2A, 2ZWR3A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00
Modelo de Bronce															
2ZWR4A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWR5A, 2ZWR6A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWR7A, 2ZWR8A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWR9A, 2ZWT1A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWT2A, 2ZWT3A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWT4A, 2ZWT5A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWT6A, 2ZWT7A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00
Modelo de Acero Inoxidable 316															
2ZWT8A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWT9A, 2ZWU1A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWU2A, 2ZWU3A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWU4A, 2ZWU5A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWU6A, 2ZWU7A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWU8A, 2ZWU9A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWX1A, 2ZWX2A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00

Apunte: Todas las dimensiones tienen una tolerancia de (+ o -) 1/8″.
(†) Esta dimensión puede variar por las especificaciones del fabricante de motor.
Se puede cambiar el motor de arrastre sin previo aviso.

ESPAÑOL

Modelos de Hierro Fundido 2ZWN9A, 2ZWP1A hasta 2ZWP9A, 2ZWR1A hasta 2ZWR3A
Modelos de Bronce 2ZWR4A hasta 2ZWR9A, 2ZWT1A hasta 2ZWT7A
Modelos de Acero Inoxidable 316 2ZWT8A, 2ZWT9A, 2ZWU1A hasta 2ZWU9A, 2ZWX1A Y 2ZWX2A

Información general de seguridad

Por favor lea cuidadosamente antes de tratar de montar, instalar, operar o hacer servicio del producto descrito. Se ofrece esta información para LA SEGURIDAD y para PREVENIR PROBLEMAS DE EQUIPOS. Para ayudar reconocer esta información, se debe observar los siguientes símbolos:

APUNTE: Indica instrucciones especiales que son importantes pero no relacionados a peligros.

IMPORTANTE: Indica factores relacionados a montar, instalar, operar o hacer servicio del producto que pueden resultar en daño a la máquina o equipo si se ignora.

⚠ PRECAUCION ***Le advierte sobre peligros que pueden causar herida personal menor o daño a propiedad si se ignora.***

⚠ ADVERTENCIA ***Le advierte sobre peligros que pueden causar herida personal grave, muerte o daño grave a propiedad si se ignora.***

⚠ PELIGRO ***Le advierte sobre peligros que pueden causar herida personal grave, muerte o daño grave a propiedad si se ignora.***

1. La mayoría de accidentes se puede prevenir al usar SENTIDO COMÚN.

⚠ PRECAUCION ***No lleve ropa holgada que pueden enredarse en el impulsor u otras partes que mueven.***
Siempre lleven ropa de seguridad apropiada, tal como anteojos de seguridad, al trabajar en la bomba o en la tubería.

⚠ PRECAUCION ***Las bombas pueden crear mucho calor y presión durante operación. Permite tiempo a la bomba que enfrié antes de manejarla o hacer servicio.***

2. Solo un eléctrico calificado debe hacer toda la instalación, operar y reparar a la bomba.

⚠ PRECAUCION ***Mantenga distancia de las aperturas de descarga y succión. No inserte dedos en la bomba que esté conectada con potencia.***

⚠ PELIGRO ***Asegure que no se bombean substancias peligrosas (inflamables, cáusticas, etc.) con tal de que la bomba esté específicamente diseñada y clasificada a manejarlas.***

3. Asegure que las manivelas de levantar estén seguramente puestas cada vez, antes de levantarla.
4. No operen a la bomba sin los dispositivos de seguridad. Siempre reemplacen los dispositivos de seguridad que han sido quitados al hacer servicio o hacer reparos.
5. No excedan la recomendación del fabricante para desempeño máximo, ya que esto puede resultar en que el motor se recaliente bastante.
6. Asegure que la bomba esté bien sujetada en su posición de operación para que no se caiga, resbale o mueva.

⚠ PELIGRO ***Estas bombas no están diseñadas ni clasificadas para uso en piscinas, instalaciones recreacionales de agua, fuentes decorativas, o en cualquier instalación donde el contacto humano con el fluido bombeado es común.***

7. La operación con una válvula de descarga cerrada causará fallo premaduro de cierre y cojinete en cualquier bomba, y en las bombas auto cebadoras el calor puede causar la generación de humo y resultar en presiones peligrosas. Se recomienda que se instale un interruptor de altas temperaturas o válvula de desahogo en la cubierta de la bomba o entre la cubierta de la bomba y cualesquier válvulas.

⚠ ADVERTENCIA ***Para reducir el riesgo de choque eléctrico se debe asegurar que la bomba esté adecuadamente conectada a tierra de acuerdo con códigos y normas como el Código Eléctrico Nacional Estadounidenses (NEC), o el Código Eléctrico de Canadá (CEC), y todos otros códigos y normas aplicables de estado, y locales. La inadecuada conexión a la tierra anula a la garantía.***

⚠ ADVERTENCIA ***Para reducir el riesgo de choque eléctrico siempre desconecte la unidad antes de hacer servicio o manejarla. Se debe desconectarla bien.***

8. Solo un eléctrico calificado debe hacer toda la conexión eléctrica.

⚠ ADVERTENCIA ***Para reducir el riesgo de choque eléctrico se debe asegurar que todas las conexiones de potencia y las conexiones de unión se hacen de acuerdo con el Código Eléctrico Nacional Estadounidenses (NEC), o el Código Eléctrico de Canadá (CEC), y todos otros códigos y normas aplicables de estado, y locales. Los requisitos pueden variar dependiendo del uso y la ubicación.***

9. Si se está utilizando tuberías, no bloqueen ni restringen la tubería de descarga, ya que la tubería de descarga puede sacudir bajo presión.

⚠ ADVERTENCIA ***Esta bomba está diseñada a manejar materias que puedan causar enfermedades o dolencias por exposición directa. Lleve ropa de protección adecuada a la hora de trabajar en la bomba o en la tubería.***

10. Los productos devueltos necesariamente deben ser limpiados, desinfectados o decontaminados antes de embarcarlos, para asegurar que los empleados no serán expuestos a peligros de salud al manejar tales materias. Se aplican todas las leyes y normas aplicables.
11. Las bombas de bronce/ latón y bombas con partes de bronce/ latón pueden contener niveles de plomo más elevados que los considerados seguros para sistemas de agua potable. Varias agencias gubernamentales han determinado que no se debe usar las aleaci-

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Información general de seguridad (Continuado)

ones de cobre plomado para aplicaciones de agua potable. Para materias de construcción sin materias de aleación de cobre plomado, por favor pónganse en contacto con la fábrica.

El Dayton Electric Mfg. Co. no se responsabiliza para pérdidas, heridas, o muerte resultando por no observar estas precauciones, mal uso o abuso de bombas o equipo.

Desembalaje e inspección

Antes de instalar la bomba, habrá que inspeccionarla cuidadosamente y asegurar que no hay ningunos repuestos dañados. Si ha habido daños, póngase en contacto y presente una solicitud de reembolso inmediatamente con la empresa de transportes que entregó la bomba. Si el manual ha sido quitado del embalaje no lo pierde.

Almacenamiento

Medio plazo - Las bombas se fabrican para el desempeño eficiente seguidas por cortos plazos de no operación, en almacenamiento. Para mejores resultados, se pueden mantener en almacenamiento, como montado en fábrica, en un ambiente seco con temperaturas constantes por un período hasta seis (6) meses.

Largo Plazo - Para almacenamiento de seis (6) meses, hasta veinticuatro (24) meses, la unidad debe estar almacenada en un lugar con temperatura de ambiente controlada, en un recinto con techo que ofrece protección de los elementos (lluvia, nieve, polvo soplado por vientos, etc.), y en que la temperatura se puede mantener entre + 40° F y + 120° F. Si se espera que la alta humedad extendida será un problema, se debe inspeccionar a todas las superficies expuestas antes de almacenar y todas las superficies que tienen la pintura rascada, dañada, o desgastada debe estar pintada de nuevo con una pintura de base agua, secada por aire. Luego a todas las superficies se debe hacer un revestimiento por aspersión de aceite protector contra óxido.

Se debe almacenar a la bomba en su contenedor original de embalaje. Para el inicio inicial, se debe girar al impulsor por mano para asegurar que el cierre y el impulsor giren libremente.

Si se requiere que la bomba debe estar probada e instalada antes del almacenamiento de largo plazo, se puede hacer tal instalación con tal de que:

1. La bomba no esté instalada por más de un (1) mes.
2. inmediatamente después de una prueba satisfactoria, se quite a la bomba, que esté secada completamente, esté puesto de nuevo en su contenedor original de embalaje y que se la ponga en un lugar de almacenamiento con temperatura de ambiente controlada.

Instalación

LTUBERÍA

Ponga a la bomba tan cerca de la fuente de fluido como posible, para que la tubería de succión esté lo más corta y directa posible. Ponga la tubería de succión en la entrada de la bomba y la salida de descarga en la salida de la bomba. Se debe usar una tubería en T en la descarga de la bomba para permitir llenar la caja con líquido antes de iniciar a la bomba. La bomba no cebará hasta que esté llenada con líquido, si no se puede hacer daño al cierre mecánico. Evite usar meandro en la tubería o en las instalaciones que puedan permitir formar bolsas de aire. Use sellador de tubería para asegurar que las conexiones estén hermetizadas. Apoyen a la tubería independientemente de la bomba para evitar carga excesiva sobre la cubierta de la bomba, que puede resultar en desalineamiento del impulsor y posible fallo de la bomba.

Se recomienda que se instale ambos una unión y una válvula de de compuerta (no suministrados) en el lado de descarga de la bomba para conveniencia de hacer servicio.

⚠ PRECAUCION ***No use una válvula esférica u otros tipos restrictivos de válvulas por el lado de descarga ya que restringirán a la capacidad de la bomba.***

⚠ ADVERTENCIA ***Esta unidad no es resistente a la*** intemperie ni se puede sumergirla en agua o ubic***ada en cualquier sitio potencialmente húmedo.***

El motor ha sido diseñado a funcionar en un sitio limpio y seco con acceso a suministro adecuado de aire de enfriamiento. Para instalaciones de afuera, el motor se debe proteger por una cubierta que no bloquee el flujo de aire.

CONEXIONES ELÉCTRICAS

1. Se deben hacer conexiones eléctricas de acuerdo con los códigos nacionales, estatales y locales.
2. Use alambre de tamaño adecuado para prevenir bajada de voltaje.
3. La bomba debe estar en una rama o circuito separado, protegido por fusibles o interruptor automático, protegido por una desconexión manual.
4. Haga conexión del suministro de potencia a los terminales del motor, siguiendo al dibujo de alambres en la placa del motor o en la placa de cubierta del terminal.

NOTA: Asegure que las conexiones a los terminales del motor correspondan al voltaje que se debe aplicar.

Verifique a los gráficos de alambre y fusibles antes de hacer conexión de alambre con la línea de servicio. Asegure que el voltaje y frecuencia del suministro de potencia estén de acuerdo con lo indicado en la placa del motor. En caso de duda, póngase en contacto con la compañía eléctrica.

Algunas bombas tienen motores de tres fases. Los motores de tres fases requieren arrancadores magnéticos, y puede funcionar en cualquier dirección, dependiendo de cómo se hacen la conexión al suministro de potencia.

Se requiere que hagan una conexión a tierra permanente de la unidad usando un conductor de tamaño adecuado desde una tubería subterránea metálica o un plomo de tierra en el panel de servicio.

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Modelos de Acero Inoxidable 316 2ZWT8A, 2ZWT9A, 2ZWU1A hasta 2ZWU9A, 2ZWX1A Y 2ZWX2A

Instalación (Continuado)

NO conecten al suministro de potencia eléctrica hasta que la unidad esté permanentemente conectada a tierra. Haga conexión del alambre de tierra a la tierra aprobada y luego conecten al terminal proporcionado.

Pre-operación

VERIFIQUE LA ROTACIÓN DE LA BOMBA TRES FASES – La rotación se indica por una flecha en la cubierta. No se debe operar a la bomba hacia atrás o en rotación reversa. Suministre momentáneamente a la potencia, mirando mientras al reverso de la bomba (en frente del final de la bomba), la eje de la bomba debe estar girando en el sentido de las agujas del reloj. Si el motor opera en la rotación errónea, se debe intercambiar cualquier de los dos alambres y esto resultará en la rotación correcta.

ROTACIÓN INCORRECTA

ÚNICA FASE – En el caso improbable que la rotación es incorrecta para una bomba de única fase, póngase en contacto con el Dayton Electric Mfg. Co.

EL CEBADO DE LA SUCCIÓN DE INUNDACIÓN

Este método de cebado de la bomba es relativamente fácil. La fuente del líquido está situada arriba de la bomba y todo lo que se necesita para el cebado de la bomba es abrir el orificio de la válvula de aire o enchufe en la cubierta de la bomba y abrir la válvula de puerta en la tubería de succión. Se debe llenar lentamente a la tubería de la succión y a la bomba hasta que se observe un chorrito estable de líquido que fluye desde el orificio de aire. Después de que la bomba empiece a funcionar, se recomienda que se abra otra vez a la válvula de aire o enchufe para segurar que todo aire ha sido expulsado desde la cubierta de la bomba.

⚠ PRECAUCION ***No inicie a la bomba hasta que haya sido llenada de agua.***

⚠ PRECAUCION ***Nunca se debe iniciar u operar seco a las bombas centrífugas. El operar a una bomba en seco causará rayado del cierre mecánico, resultando en el fallo pre-maduro del cierre. Para prevenir que la bomba funcione en seco, se debe hacer cebado de la bomba antes de iniciarla.***

INICIAR

Para el inicio inicial, se debe cerrar a la válvula de puerta en la tubería de descarga, y abierto gradualmente cuando el motor consigue velocidad alta, generalmente dentro de cinco o diez segundos. Después de que la bomba haya sido en operación por una vez hasta que la línea de descarga haya sido completamente llenada, luego no es necesario cerrar la válvula de puerta al iniciar.

SERVICIO ESTACIONAL

Para poner fuera de servicio;

1. Vacíe el líquido de la bomba para prevenir que haya congelación y daño a la cubierta de la bomba. Se recomienda que se ponga un buen inhibidor contra óxido en el lado fin de líquido para prevenir excesiva corrosión. Mantengan a la bomba seca y cubierta.
2. Para vaciar, quite al enchufe de drenaje que está situado debajo de la entrada de la bomba. Vacíe a la tubería de entrada hasta debajo de la línea de helar. También se debe vaciar todas otras tuberías que pueden estar expuestas a temperaturas de bajo cero.
3. Quite el enchufe de cebado. Esto ayudará en vaciar el cuerpo de la bomba al permitir aire entrar en la caja.

Para reemplazar a la bomba en servicio de nuevo:

1. Reemplace a todos los enchufes de drenaje anteriormente quitados, usando compuesto de unión de tuberías en todas las roscas varones.
2. Asegure que las líneas de succión y de descarga han sido reconectadas y bien apretadas.
3. Verifique y asegure que el eje de la bomba gira libremente.
4. Verifique en la placa de la bomba si el motor ha sido configurado para los requisitos suyos de voltaje.
5. Haga cebado e inicie.

Mantenimiento

⚠ ADVERTENCIA ***¡Asegure que la unidad esté desconectada de la fuente de potencia antes de hacer servicio o manejarla!***

QUITAR EL CIERRE ANTIGUO DE LA UNIDAD

Si el cierre mecánico antiguo de la unidad (Núm. de Ref. 4 & 5) necesita reparación, haga lo siguiente y refiere a Dibujos Núm. 3 hasta 7.

IMPORTANTE: ¡Siempre reemplace al asiento de cierre y la cabeza del cierre para asegurar acoplamiento adecuado de los componentes!

1. Quite los tornillos (Núm. de Ref. 11) conectando a la caja (Núm. de Ref. 9) al adaptador (Núm. de Ref. 2).
2. Quite a la caja.

⚠ PRECAUCION ***Cuídese de que en el anillo-o entre el adaptador y la caja no haya contracción ni que haya sido recortado (Núm. de Ref. 8).***

NOTA: Se debe sujetar bien al eje del motor para quitar al impulsor. Detrás del motor hay una ranura en el eje (use destornillador grande para sujetar). Impulsor (Núm. de Ref. 7) destornilla al CCW cuando está mirando hacia delante de la bomba.

IMPORTANTE: Se debe tener cuidado y asegurarse que se use el mismo número y espesor de arandela (Núm. de Ref. 6) detrás del impulsor que las que se habían quitado. Las arandelas están

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Mantenimiento (Continuado)

situadas directamente detrás del impulsor y se hacen libres cuando se quite el impulsor.

3. Se puede quitar a la cabeza de cierre (Núm. de Ref. 5) desde el eje (Véase Dibujo 4).
4. quite al adaptador del motor (Núm. de Ref. 2) desde el motor al quitar los cerrojos del adaptador (Núm. de Ref. 3).
5. Use una clavija de madera para empujar fuera al asiento de cierre (Núm. de Ref. 4) desde el adaptador (Núm. de Ref. 2) (Véase Dibujo 5).

INSTALACIÓN DEL NUEVO CIERRE DE LA UNIDAD

⚠ PRECAUCION ***Se pueden hacer daño fácilmente a las caras de precisión hechos de carbono/cerámico en el cierre mecánico. Maneje a su cierre de repuesto cuidadosamente. No toque a las superficies y las caras hechas de carbono/cerámico.***

IMPORTANTE: Asegure que el hombro de eje no haga daño a la cara de carbono.

1. Limpie bien a todas las superficies de la cavidad asiento de cierre en el adaptador (Núm. de Ref. 2).
2. Utilice una tela limpia, limpie al eje y hombro del eje y asegure que estén bien limpios.

NOTA: Inspeccione al eje del motor para rayas o ranuras espirales. Si existen reemplace al motor.

3. Moje a la porción de goma del nuevo asiento de cierre (Núm. de Ref. 4) con una cubierta ligera de agua jabonoso. Mientras están llevando guantes limpios o usando una tela limpia liviana, presione al asiento de cierre directamente en la cavidad del adaptador. Use a la arandela (generalmente enviada junto con el nuevo cierre) a poner sobre la superficie pulida y use una pieza de tubería o la clavija para empujar dentro firmemente pero con delicadeza. Evite hacer rayas en la cara blanca de cerámico (Véase Dibujo 6).
4. Tire a la arandela de cartón. Averigüe de nuevo si la superficie esté libre de polvo u otras partículas extranjeras y que no haya sido dañada ni rascada.
5. Moje a la porción interior de goma del nuevo asiento de cierre (Núm. de Ref. 5) con una cubierta ligera de agua jabonoso. Deslice a la cabeza sobre el eje del motor con la superficie de cerrar (Véase Dibujo 7). Con esto se termina la instalación de cierre.

NOTA: Puede ser necesario tener un corto período de "funcionamiento" para ofrecer una operación completamente hermética.

6. Atornille al impulsor (Núm. de Ref. 5) en el eje. Use la ranura para destornillador detrás del eje del motor (opuesto al fin con roscas) para apretar al impulsor.

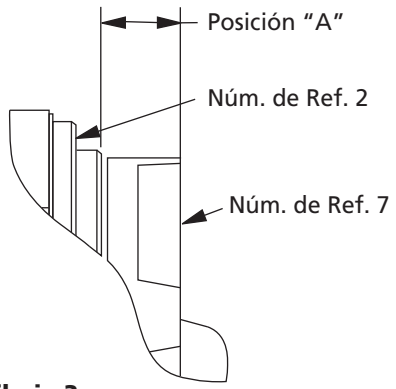
NOTA: Puede ser necesario quitar la tapa del enchufe de motor para exponer a la ranura. Si quitado, asegure reinstalar al enchufe DESPUÉS de haber instalado a la bomba completamente.

7. Al reemplazar a las cuñas originales que se suministraron con la bomba, se debe ajustar adecuadamente a la altura el impulsor. La tabla que acompaña al Dibujo 3 da el correcto adaptador a la dimensión de altura del motor para el desempeño óptimo de la bomba. Después de instalación, verifique si el eje gira libremente al girar al impulsor. Si se encuentra goma o atador, quite al impulsor y añade una cuña (Núm. de Ref. 6) al eje, y luego reverifique. Repite al procedimiento hasta que toda la goma haya sido eliminada.
8. Ponga un anillo-o (Núm. de Ref. 8) en la pestaña de montar adaptador. Apretar a la caja usando pernos (Núm. de Ref. 8) teniendo cuidado de que en el anillo-o entre el adaptador y la caja no haya contracción ni que haya sido recortado. Al apretar a la caja, periódicamente gire al impulsor para verificar si hay interferencia con la caja.

⚠ PRECAUCION ***El cierre producirá una resistencia menor cuando está girando el eje del motor, pero ¡se debe eliminar la fricción en cualquier otro sitio! Si no, esto puede resultar en daño a la bomba y/o motor.***

AJUSTE DE LA CUÑA DEL IMPULSOR

Modelo	Posición "A"
2ZWR4A, 2ZWN9A, 2ZWT8A	0.634"-0.674"
2ZWR5A, 2ZWP1A, 2ZWT9A	0.742"-0.782"
2ZWR6A, 2ZWP2A, 2ZWU1A	
2ZWR7A, 2ZWR8A, 2ZWP3A,	
2ZWP4A, 2ZWU2A, 2ZWU3A	0.755"-0.795"
2ZWR9A, 2ZWP5A, 2ZWU4A	0.873"-0.913"
2ZWT1A, 2ZWP6A, 2ZWU5A	
2ZWT2A, 2ZWT3A, 2ZWP7A,	
2ZWP8A, 2ZWU6A, 2ZWU7A	0.874"-0.914"

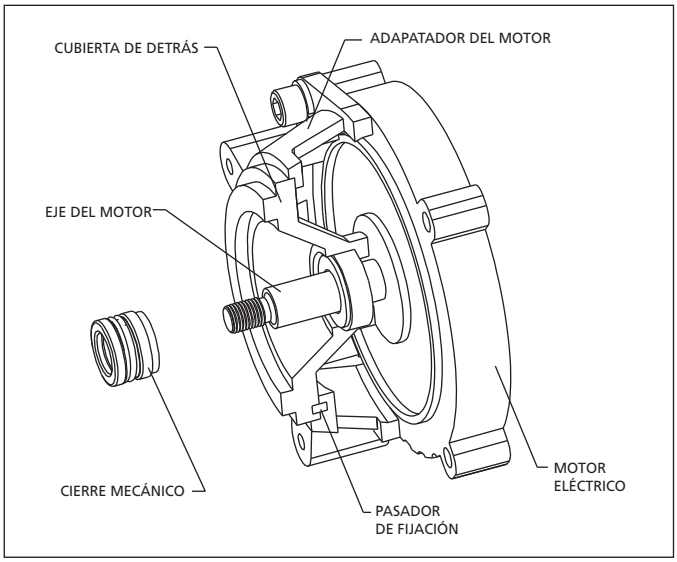


Dibujo 3

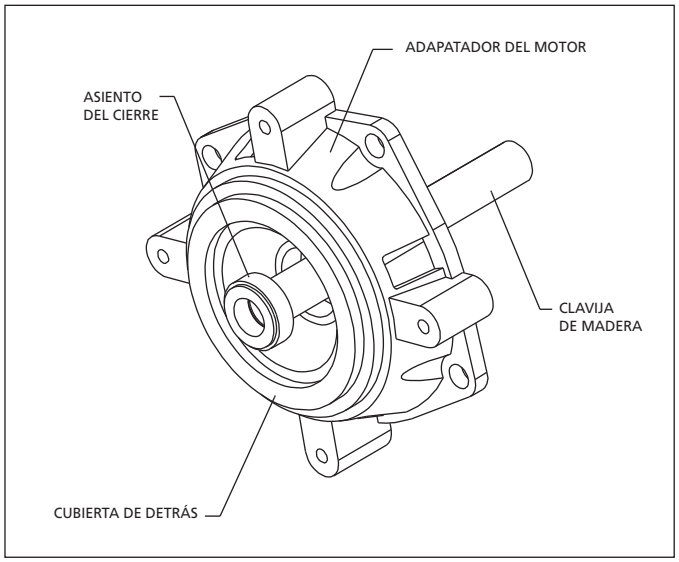
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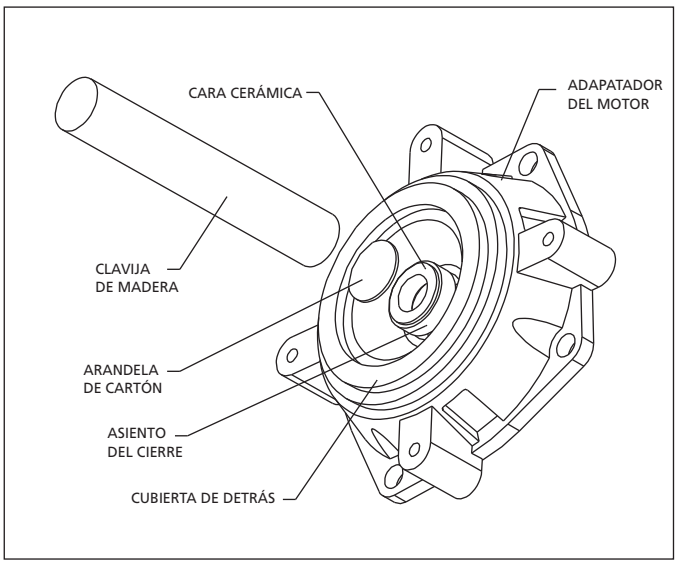
Quitar e instalar el montaje del cierre (Dibujos 4 hasta 7)



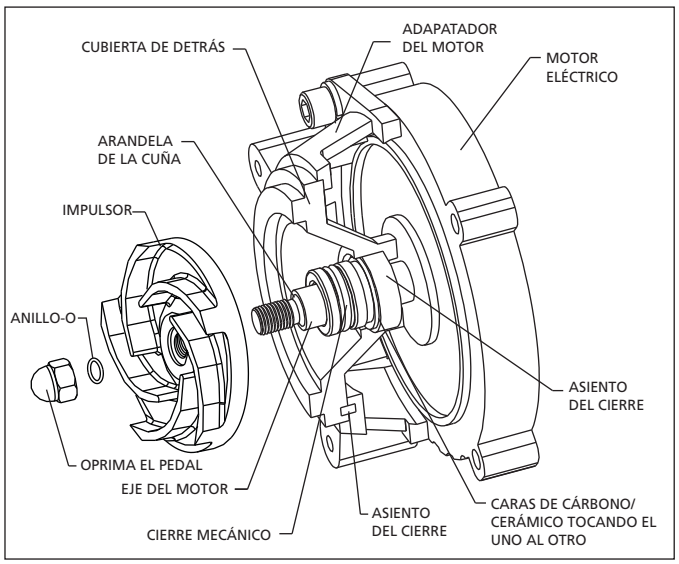
Dibujo 4 – Quitar el cierre



Dibujo 5 – Quitar el asiento del cierre



Dibujo 6 – Montaje del asiento de cierre



Dibujo 7 – Montaje del cierre

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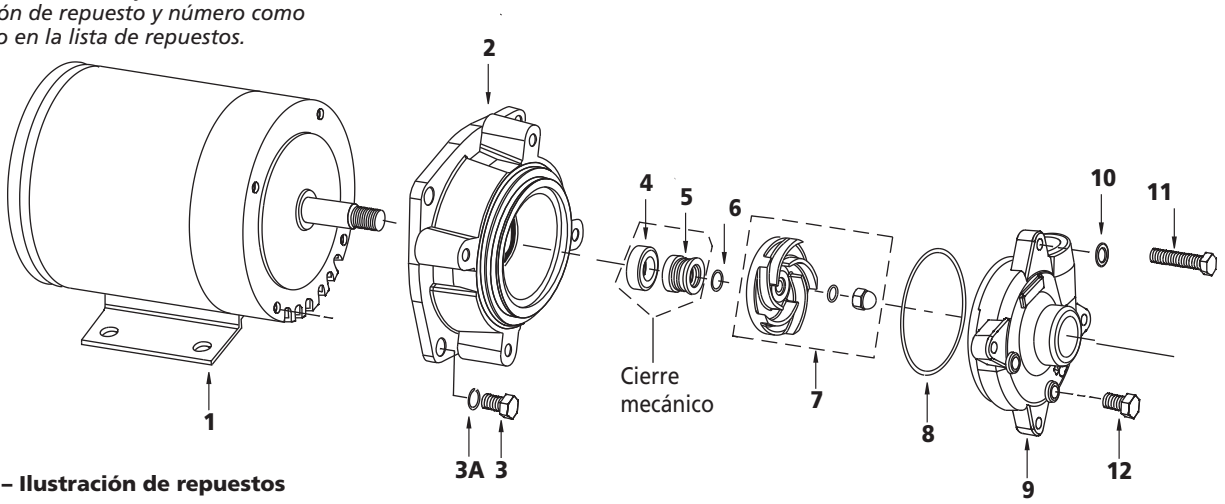
Tabla de Resolver Problemas

Síntoma	Causa(s) Posible(s)	Acción Correctiva
La bomba funciona pero no fluido	1. Incorrecta tubería de succión	1. Reemplace a la tubería
	2. Bomba ubicada muy lejos desde la fuente del líquido	2. Reubique a la bomba
	3. La válvula de puerta cerrada	3. Abra a la válvula
	4. El filtro atascado	4. Limpie o reemplace al filtro
	5. Válvula de pie roto	5. Limpie o reemplace a la válvula
	6. Altura de descarga demasiada alta, o larga	6. Baje a la altura de descarga, haga la tubería más corta
La bomba no cebará o retendrá cebado después de operación	1. Fuga de aire en la tubería de succión	1. Repare o reemplace
	2. El filtro o válvula de pie atascado	2. Limpie o reemplace
	3. La válvula de pie con fugas	3. Limpie o reemplace a la válvula de pie
La velocidad de flujo es baja	1. La tubería está obstruida o dañada	1. Limpie o reemplace
	2. Impulsor atascado o desgastado	2. Limpie o reemplace
	3. La línea de descarga restringida o de tamaño pequeño	3. Purgue a la tubería o reemplace
	4. Obstrucción de tuberías	4. Elimine obstrucciones
La bomba inicia y para bombear	1. Impulsor está obstruido	1. Limpie al impulsor y bomba
	2. Cierre mecánico defectuoso	2. Reemplace al cierre
	3. Fuga en la línea de succión	3. Repare o reemplace a la línea de succión
	4. Fuga en la válvula de pie	4. Repare o reemplace a la válvula de pie
Ruido excesivo mientras la bomba está operando	1. Bomba no está bien sujetada a base firme	1. Sujete bien a la bomba
	2. La tubería no apoyada a aliviar cualquier tensión en el montaje de la bomba	2. Hagan los ajustes necesarios
	3. Línea de succión obstruida	3. Limpie y corrija a la línea de succión
Líquido gotea desde el punto donde el eje entra en la caja de la bomba, cuando la bomba está llena de líquido	1. Cierre mecánico dañado	1. Reemplace (véase reemplazamiento de cierre mecánico)

Para repuestos, llame al 1-800-Grainger

24 horas al día – 365 días al año

Por favor faciliten la siguiente información:
-Número de modelo
- Número de serie (si hay)
-Descripción de repuesto y número como mostrado en la lista de repuestos.



Dibujo 8 – Ilustración de repuestos

Lista de repuestos para Bombas de Hierro Fundido 2ZWN9A, 2ZWP1A hasta 2ZWR1A hasta 2ZWR3A

Núm. de ref.	Descripción	Número de repuestos para Modelos 2ZWN9A	2ZWP1A 2ZWP2A	2ZWP3A 2ZWP4A	2ZWP5A 2ZWP6A	2ZWP7A 2ZWP8A	2ZWP9A 2ZWR1A	2ZWR2A 2ZWR3A	Cantidad
1	Motor* * *	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Adaptador de bomba	PPL2305CG	PPL2306CG	PPL2306CG	PPL2307CG	PPL2307CG	PPL2308CG	PPL2308CG	1
3	Perno, plateado con zinc 3/8-16 x 1"	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	Perno, plateado con zinc 3/8-16 x 3/4"	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	Arandela de presión, plateado con zinc 3/8"	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Cierre mecánico y montaje de asiento (estándar) Buna-N	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	Cierres opcionales disponibles * *								
	† Cierre mecánico y montaje de asiento Viton	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	† Cierre mecánico y montaje de asiento de carburo de silicio	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	Conjunto de impulsor de cuña	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Impulsor con Tuerca y anillo-O	PPL2201CGG	PPL2202CGG	PPL2203CGG	PPL2204CGG	PPL2205CGG	PPL2206CGG	PPL2207CGG	1
8	Anillo-O Buna-N	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
	†Anillo-O Viton	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
9	Caja de bomba	PPL2101CG	PPL2102CG	PPL2102CG	PPL2103CG	PPL2103CG	PPL2104CG	PPL2105CG	1
10	Arandela de presión, Acero inoxidable, Plateado con zinc*	PPL3201G	PPL3201G	PPL3201G	PPL3201G	PPL3201G	-	-	4
	Arandela de presión, Acero inoxidable, Plateado con zinc*	-	-	-	-	-	PPL3203G	PPL3203G	3
11	Perno de cabeza hexagonal, Acero inoxidable, Plateado con zinc, 5/16-18*	PPL3104G	PPL3104G	PPL3104G	PPL3106G	PPL3106G	N/A	N/A	4
	Perno de cabeza hexagonal, Acero inoxidable, Plateado con zinc, grande 7/16-14*	N/A	N/A	N/A	N/A	N/A	PPL3112G	PPL3114G	2
	Perno de cabeza hexagonal, Acero inoxidable, Plateado con zinc, corto 7/16-14*	N/A	N/A	N/A	N/A	N/A	PPL3108G	PPL3110G	1
12	Enchufe de tubería, Plateado con zinc*	PPL3501G	PPL3501G	PPL3501G	PPL3501G	PPL3501G	-	-	2
	Enchufe de tubería, Plateado con zinc*	-	-	-	-	-	PPL3504G	PPL3504G	1

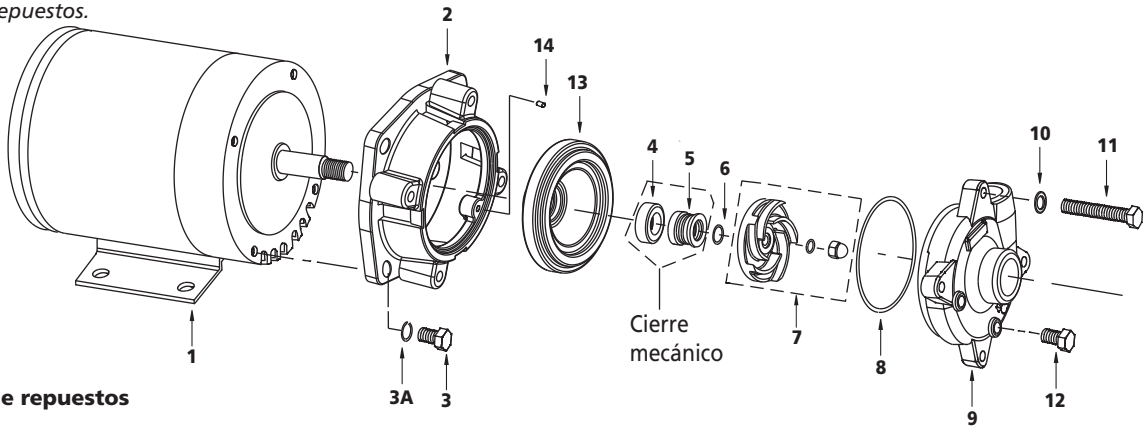
(*) Artículo estándar de ferretería, disponible localmente
(†) Opcional
(***) Se puede cambiar el conductor de arrastre sin aviso previo, véase etiqueta en arrastre para especificaciones verdades.
SS Acero inoxidable
(**) Nota: Cierre mecánico Viton y Buna-N tienen carbono en las caras cerámicas.
Los cierres mecánicos de carburo de silicio tienen fuelles de Viton.
Todos cierres tienen componentes metálicos de 316 SS.

ESPAÑOL

Para repuestos, llame al 1-800-Grainger

24 horas al día – 365 días al año

Por favor faciliten la siguiente información:
-Número de modelo
- Número de serie (si hay)
-Descripción de repuesto y número como mostrado en la lista de repuestos.



Dibujo 9 – Ilustración de repuestos

Lista de repuestos para Bombas de Bronce 2ZWR4A hasta 2ZWR9A, 2ZWT1A hasta 2ZWT7A

Núm. de ref.	Descripción	Número de repuestos para Modelos 2ZWR4A	2ZWR5A 2ZWR6A	2ZWR7A 2ZWR8A	2ZWR9A 2ZWT1A	2ZWT2A 2ZWT3A	2ZWT4A 2ZWT5A	2ZWT6A 2ZWT7A	Cantidad
1	Motor* * *	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Adaptador de bomba	PPL2309CG	PPL2310CG	PPL2310CG	PPL2311CG	PPL2311CG	PPL2312CG	PPL2312CG	1
3	Perno, plateado con zinc 3/8-16 x 1"	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	Perno, plateado con zinc 3/8-16 x 3/4"	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	Arandela de presión, plateado con zinc 3/8"	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Cierre mecánico y montaje de asiento (estándar) Buna-N	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	Cierres opcionales disponibles * *								
	† Cierre mecánico y montaje de asiento Viton	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	† Cierre mecánico y montaje de asiento de carburo de silicio	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	Conjunto de impulsor de cuña	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Impulsor con Tuerca y anillo-O	PPL2201BGG	PPL2202BGG	PPL2203BGG	PPL2204BGG	PPL2205BGG	PPL2206BGG	PPL2207BGG	1
8	Anillo-O Buna-N	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
	†Anillo-O Viton	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
9	Caja de bomba	PPL2101BG	PPL2102BG	PPL2102BG	PPL2103BG	PPL2103BG	PPL2104BG	PPL2105BG	1
10	Arandela de presión, Acero inoxidable, Plateado con zinc*	PPL3201G	PPL3201G	PPL3201G	PPL3201G	PPL3201G	-	-	4
	Arandela de presión, Acero inoxidable, Plateado con zinc*	-	-	-	-	-	PPL3203G	PPL3203G	3
11	Perno de cabeza hexagonal, Acero inoxidable, Plateado con zinc, 5/16-18*	PPL3104G	PPL3104G	PPL3104G	PPL3106G	PPL3106G	N/A	N/A	4
	Perno de cabeza hexagonal, Acero inoxidable, Plateado con zinc, grande 7/16-14*	N/A	N/A	N/A	N/A	N/A	PPL3112G	PPL3114G	2
	Perno de cabeza hexagonal, Acero inoxidable, Plateado con zinc, corto 7/16-14*	N/A	N/A	N/A	N/A	N/A	PPL3108G	PPL3110G	1
12	Enchufe de tubería, Latón*	PPL3503G	PPL3503G	PPL3503G	PPL3503G	PPL3503G	-	-	2
	Enchufe de tubería, Latón*	-	-	-	-	-	PPL3506G	PPL3506G	1
13	Cubierta delantera	PPL2315BG	PPL2316BG	PPL2316BG	PPL2317BG	PPL2317BG	PPL2318BG	PPL2318BG	1
14	Clavija cilíndrica	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	2

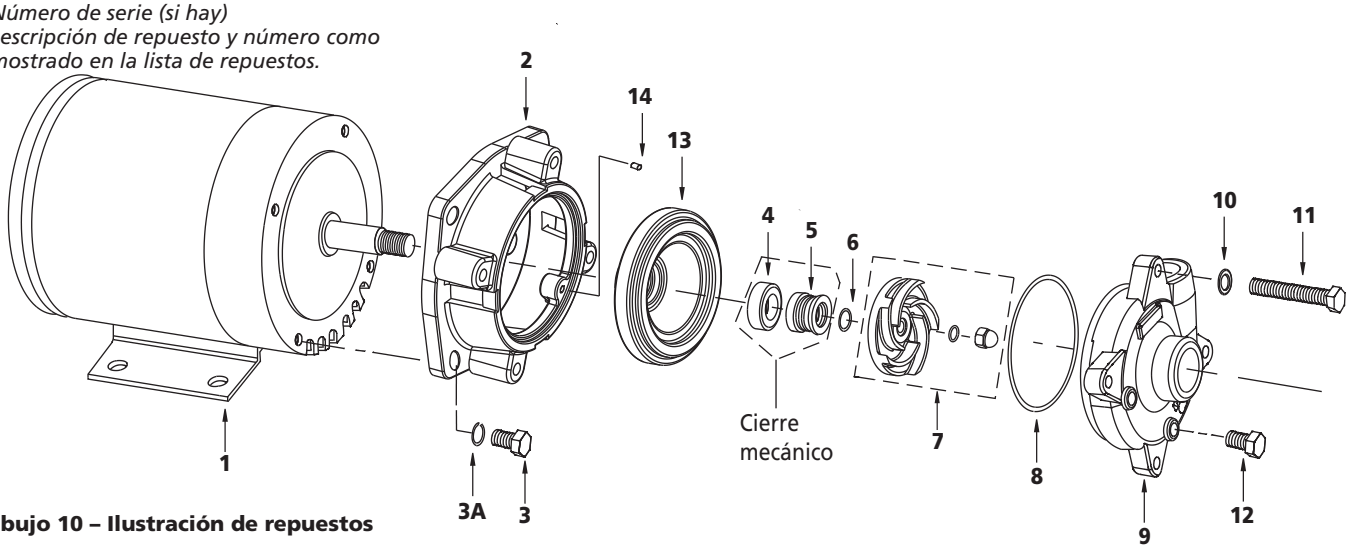
(*) Artículo estándar de ferretería, disponible localmente
(†) Opcional
(***) Se puede cambiar el conductor de arrastre sin aviso previo, véase etiqueta en arrastre para especificaciones verdades.
SS Acero inoxidable
(**) Nota: Cierre mecánico Viton y Buna-N tienen carbono en las caras cerámicas.
Los cierres mecánicos de carburo de silicio tienen fuelles de Viton.
Todos cierres tienen componentes metálicos de 316 SS.

ESPAÑOL

Para repuestos, llame al 1-800-Grainger

24 horas al día – 365 días al año

Por favor faciliten la siguiente información:
-Número de modelo
- Número de serie (si hay)
-Descripción de repuesto y número como mostrado en la lista de repuestos.



Dibujo 10 – Ilustración de repuestos

Lista de repuestos para Bombas de Acero Inoxidable 316 2ZWT8A, 2ZWT9A, 2ZWU1A hasta 2ZWU9A, 2ZWX1A hasta 2ZWX2A

Núm. de ref.	Descripción	Número de repuestos para Modelos 2ZWT8A	2ZWT9A 2ZWU1A	2ZWU2A 2ZWU3A	2ZWU4A 2ZWU5A	2ZWU6A 2ZWU7A	2ZWU8A 2ZWU9A	2ZWX1A 2ZWX2A	
1	Motor* * *	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Adaptador de bomba	PPL2309CG	PPL2310CG	PPL2310CG	PPL2311CG	PPL2311CG	PPL2312CG	PPL2312CG	1
3	Perno, plateado con zinc 3/8-16 x 1"	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	Perno, plateado con zinc 3/8-16 x 3/4"	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	Arandela de presión, plateado con zinc 3/8"	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Cierre mecánico y montaje de asiento (estándar) Viton	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	† Cierre mecánico y montaje de asiento (estándar) Buna-N	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	† Cierre mecánico y montaje de asiento de carburo de silicio	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	Conjunto de impulsor de cuña	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Impulsor con Tuerca y anillo-O	PPL2201SGG	PPL2202SGG	PPL2203SGG	PPL2204SGG	PPL2205SGG	PPL2206SGG	PPL2207SGG	1
8	Anillo-O Buna-N	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
	†Anillo-O Viton	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
9	Caja de bomba	PPL2101SG	PPL2102SG	PPL2102SG	PPL2103SG	PPL2103SG	PPL2104SG	PPL2105SG	1
10	Arandela de presión, 316 SS*	PPL3202G	PPL3202G	PPL3202G	PPL3202G	PPL3202G	-	-	4
	Arandela de presión, 316 SS*	-	-	-	-	-	PPL3204G	PPL3204G	3
11	Perno de cabeza hexagonal, 5/16-18 316 SS*	PPL3105G	PPL3105G	PPL3105G	PPL3107G	PPL3107G	N/A	N/A	4
	Perno de cabeza hexagonal, grande 7/16-14 316 SS*	N/A	N/A	N/A	N/A	N/A	PPL3113G	PPL3115G	2
	Perno de cabeza hexagonal, corto 7/16-14 316 SS*	N/A	N/A	N/A	N/A	N/A	PPL3109G	PPL3111G	1
12	Enchufe de tubería, 316 SS*	PPL3502G	PPL3502G	PPL3502G	PPL3502G	PPL3502G	-	-	2
		-	-	-	-	-	PPL3505G	PPL3505G	1
13	Cubierta delantera	PPL2315SG	PPL2316SG	PPL2316SG	PPL2317SG	PPL2317SG	PPL2318SG	PPL2318SG	1
14	Clavija cilíndrica	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	2

(*) Artículo estándar de ferretería, disponible localmente
(†) Opcional
(***) Se puede cambiar el conductor de arrastre sin aviso previo, véase etiqueta en arrastre para especificaciones verdades.
SS Acero inoxidable
(**) Nota: Cierre mecánico Viton y Buna-N tienen carbono en las caras cerámicas.
Los cierres mecánicos de carburo de silicio tienen fuelles de Viton.
Todos cierres tienen componentes metálicos de 316 SS.

ESPAÑOL

Apunte

Apunte

Dayton® Bombas de Centrífugo Acoplamiento Estrecho

Hierro Fundido, Bronce y de Acero inoxidable 316

GARANTÍA LIMITADA DAYTON DE UN AÑO. *LAS DAYTON® BOMBAS DE CENTRÍFUGO ACOPLAMIENTO ESTRECHO, LOS MODELOS DESCRITOS EN ESTE MANUAL, TIENEN LA GARANTÍA LIMITADA DE DAYTON ELECTRIC MFG. CO. (DAYTON) AL USUARIO ORIGINAL CONTRA DEFECTOS EN MANO DE OBRA O MATERIALES CON USO NORMAL POR UN AÑO DESDE LA FECHA DE COMPRA. CUALQUIER REPUESTO QUE SE IDENTIFIQUE QUE TENGA DEFECTO EN MATERIAL O MANO DE OBRA Y QUE SE DEVUELVE A UN LOCAL AUTORIZADO DE SERVICIO, COMO DESIGNADO POR DAYTON, LOS COSTOS DE EMBARQUE PREPAGADOS, SERÁN, COMO REMEDIO EXCLUSIVO, REPARADO O REEMPLAZADO A LA OPCIÓN DE DAYTON. PARA LOS PROCIDIMIENTOS DE RECLAMAR LA GARANTÍA LIMITADA, VÉASE "DISPOSICIÓN RÁPIDA" ABAJO. ESTA GARANTÍA LIMITADA ENTREGA AL COMPRADOR DERECHOS ESPECÍFICOS LEGALES QUE PUEDEN VARIAR DE JURISDICCIÓN A JURISDICCIÓN.*

LIMITACIÓN DE RESPONSABILIDAD. *HASTA LA MEDIDA PERMITIDA DE ACUERDO CON LAS LEYES EN VIGOR, LA RESPONSABILIDAD DE DAYTON PARA DAÑOS CONSECUENCIALES E INCIDENTALES EXPRESAMENTE SE RENUNCIA. LA RESPONSABILIDAD DE DAYTON EN TODOS CASOS SE LIMITA A Y NO SUPERARÁ EL PRECIO PAGADO AL COMPRAR.*

RENUNCIA DE GARANTÍA. *SE HA HECHO UN ESFUERZO DILIGENTE PARA SUMINISTRAR LA INFORMACIÓN DEL PRODUCTO E ILUSTRAR LOS PRODUCTOS EN ESTE MANUAL CORRECTAMENTE; SIN EMBARGO, TALES INFORMACIÓN E ILUSTRACIONES SON PARA EL ÚNICO FIN DE IDENTIFICACIÓN, Y NO EXPRESAN NI IMPLICAN UNA GARANTÍA QUE LOS PRODUCTOS SON PARA LA VENTA, O ADECUADO PARA UN FIN PARTICULAR, NI QUE EL PRODUCTO NECESARIAMENTE CONFORMARÁ CON LAS ILUSTRACIONES O DESCRIPCIONES. EXCEPTO COMO DETALLADO ABAJO, NO HAY NINGUNA GARANTÍA NI AFIRMACIÓN DE HECHO, EXPRESADO NI SUPUESTO, ADEMÁS DE LO QUE HA SIDO DECLARADO EN LA "GARANTÍA LIMITADA" ARRIBA QUE HA SIDO HECHO O AUTORIZADO POR DAYTON.*

Aviso técnico y recomendaciones, Renuncia. *No obstante cualquier práctica o negocios o aduanas, las ventas no incluirán el asesoramiento de avisos técnicos ni asistencia ni diseño de sistemas. Dayton no asume ningunas obligaciones o responsabilidad por cualesquier recomendaciones, opiniones o avisos no autorizados en cuanto a la elección, instalación o uso de los productos.*

ESPAÑOL

Aptabilidad de producto. *Muchas jurisdicciones tienen códigos y regulaciones en cuanto a las ventas, la construcción, instalación, y/o uso de productos para propuestas específicas, que puedan variar de los en áreas vecinas. Mientras que se haya hecho todo para asegurar que los productos Dayton estén de acuerdo con tales códigos, Dayton no puede garantizar conformidad, ni puedes ser responsable por cómo se instale o use el producto. Antes de comprar y usar el producto, revise las aplicaciones del producto, y todos los aplicables códigos y normas nacionales y locales, y asegure que el producto, su instalación, y uso estará según ellos.*

Ciertos aspectos de las renuncias no se aplican a los productos de los consumidores; por ej., (a) algunas jurisdicciones no permiten la exclusión o limitación de daños consecuenciales e incidentales, así que la susodicha limitación o exclusión puede que no sea aplicable a Vd.; (b) además, algunas jurisdicciones no permiten una limitación de por cuánto tiempo durará una garantía implicada, consecuentemente la susodicha limitación puede que no sea aplicable a Vd.; y (c) según ley, durante el período de esta Garantía Limitada, cualquier garantía implicada de ser apto para venta o ser apto para un fin específico aplicable a los productos de consumidores comprados por consumidores, puede que no sea excluida o de otra manera sea renunciada.

Disposición rápida. *Se hará un esfuerzo de Buena fe para la rápida corrección u otros ajustes en cuanto a cualquier producto que sea defectuoso dentro de la garantía limitada. Para cualquier producto que se cree que tenga defectos dentro de la garantía limitada, primero que escriba o llame al vendedor desde quien se compró el producto. El vendedor le dará direcciones adicionales. Si sea incapaz de resolver satisfactoriamente, escriba a la dirección de Dayton dada abajo, dando el nombre, la dirección del vendedor, además de la fecha y número del justificante del vendedor, y describa el tipo de defecto. El título y riesgo de pérdida se traspasan al comprador con la entrega a un portador común. Si el producto fue dañado en tránsito a Vd., por favor que lo reclame con el portador.*

Fabricado por Dayton Electric Mfg. Co., 100 Grainger Parkway, Lake Forest, Illinois 60,045 EE.UU.

Veuillez lire et conserver ces directives. ***Lisez attentivement avant de tenter d'assembler, d'installer, ou d'entretenir le produit décrit. Protégez vous-même et d'autres en suivant toutes les directives de sécurité. Non-respect des directives pourrait se terminer en blessure personnelle et / ou en dégâts matériels ! Conservez les directives pour toue consultation dans l'avenir.***

Pompes Centrifuges Doubles-proches de Dayton®

La Fonte, le Bronze et 316 Acier inoxydable

Description

Dayton à couplage en fonte, en bronze ou en acier inoxydable 316 unités pompe en continu, la production de haut débit à bas-tête conditions. Conçu pour continu à basse pression et la circulation transfert de liquides ininflammables, l'utilité, chaudière, transfert général, filtration, tours de refroidissement, de retour de condensat, les applications marines, fontaines, relais, la circulation de l'eau, l'irrigation, systèmes de pulvérisation, pompe jockey service, de traitement chimique, applications liquides agressifs et à d'autres fins générales de pompage compatible avec pompe composées de matières en l'absence d'ascenseur ou d'aspiration pas de soi est nécessaire d'amorçage.

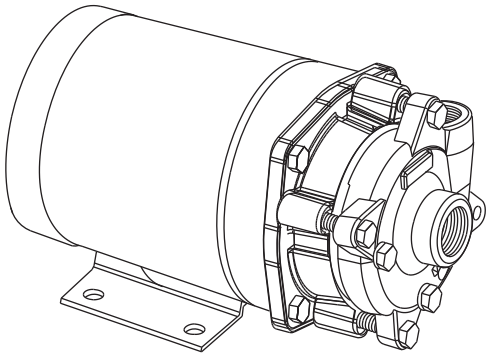


Figure 1

Spécifications

Température ..... 40 ° F à 200°F max
La Pression d'Arrivée de Max de maximum de F livres par pouce carré (kpa)..... 200 (1379)
Le Pousseur ..... Semi-Ouvert
Peint ..... l'émail sec aérien
Cachet ..... du carbone/le Sceau mécanique Céramique
Vitesse ..... 3450 tr-min
Le Moteur ..... la preuve de goutte ouverte / le ventilateur complètement entouré a enclos construction refroidie (56J Cadre) et sont évalué pour l'opération de devoir
Phase Seule. ..... Début de condensateur. Inclut la protection de surcharge dans le moteur
Trois Phase. ..... Doit être installé avec le démarreur magnétique qui fournit la protection de 3 jambes plein.

Fonte Modèles	Bronze Modèles	316 le Sans tache Modèles D'acier	Détails à moteur					Pleine charge Ampères	Taille de port	
			HP	Phase	Volt	Hz	Clôture		Succion	Renvoi
2ZWN9A	2ZWR4A	2ZWT8A	1/3	1	115/230	60	ODP	7.5/3.8	1″	3/4″
2ZWP1A	2ZWR5A	2ZWT9A	1/2	1	115/230	60	ODP	8.4/4.8	1¼″	1″
2ZWP2A	2ZWR6A	2ZWU1A	1/2	3	208-230/460	60	ODP	1.8-1.7/0.9	1¼″	1″
2ZWP3A	2ZWR7A	2ZWU2A	3/4	1	115/230	60	ODP	11.3/5.6	1¼″	1″
2ZWP4A	2ZWR8A	2ZWU3A	3/4	3	208-230/460	60	ODP	2.7-2.5/1.2	1¼″	1″
2ZWP5A	2ZWR9A	2ZWU4A	1	1	115/230	60	ODP	14.4/7.2	1½″	1¼″
2ZWP6A	2ZWT1A	2ZWU5A	1	3	208-230/460	60	ODP	3.7-3.2/1.6	1½″	1¼″
2ZWP7A	2ZWT2A	2ZWU6A	1½	1	115/208-230	60	ODP	17.0/9.0-8.5	1½″	1¼″
2ZWP8A	2ZWT3A	2ZWU7A	1½	3	208-230/460	60	ODP	4.4-3.9/2.0	1½″	1¼″
2ZWP9A	2ZWT4A	2ZWU8A	2	1	115/208-230	60	TEFC	16.6/9.4-8.3	1½″	1¼″
2ZWR1A	2ZWT5A	2ZWU9A	2	3	208-230/460	60	TEFC	6.0-5.8/2.9	1½″	1¼″
2ZWR2A	2ZWT6A	2ZWX1A	3	1	230	60	TEFC	12.5	2″	1½″
2ZWR3A	2ZWT7A	2ZWX2A	3	3	208-230/460	60	TEFC	8.3-7.6/3.8	2″	1½″

NOTE : ODP = Ouvre Goutte-Preuve TEFC = Totalement-Enclos Ventilateur-Refroidi

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Matiere De Pompe

Modèle	Adaptateur moteur	Encaissage	Pousseur	Matière de Puits	Matériel	*Cachets
Fonte Modèles						
2ZWN9A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP1A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP2A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP3A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP4A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP5A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP6A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP7A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP8A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWP9A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWR1A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWR2A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
2ZWR3A	CI	CI	CI	304SS	Le zinc Plaqué	Buna-N
Bronze Modèles						
2ZWR4A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWR5A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWR6A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWR7A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWR8A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWR9A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWT1A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWT2A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWT3A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWT4A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWT5A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWT6A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
2ZWT7A	CI / BR	BR	BR	304SS	Le zinc Plaqué	Buna-N
316 le Sans tache Modèles D'acier						
2ZWT8A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWT9A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU1A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU2A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU3A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU4A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU5A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU6A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU7A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU8A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWU9A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWX1A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton
2ZWX2A	CI / 316 SS	316 SS	316 SS	304SS	SS	Viton

NOTE : SS=Sans tache acier BR = Bronze CI =fonte
(*) Le cachet de Puits contient aussi l'acier inoxydable, les composantes céramiques et de carbone

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Modèles de Fonte: 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A
Modèles de Bronze: 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A
316 Modèles d'Acier inoxydable: 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

Représentation

Modèle	HP	Phase	GPM de l'eau à Total pieds à la tête 10′	15′	20′	30′	40′	50′	60′	70′	Shut Off
Fonte Modèles											
2ZWN9A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWP1A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWP2A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWP3A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWP4A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWP5A	1	1	88	83	77	64	50	29	-	-	58
2ZWP6A	1	3	88	83	77	64	50	29	-	-	58
2ZWP7A	1½	1	115	109	104	94	81	64	40	-	67
2ZWP8A	1½	3	115	109	104	94	81	64	40	-	67
2ZWP9A	2	1	122	115	109	98	84	68	46	10	72
2ZWR1A	2	3	122	115	109	98	84	68	46	10	72
2ZWR2A	3	1	170	166	162	146	130	110	82	35	74
2ZWR3A	3	3	170	166	162	146	130	110	82	35	74
Bronze Modèles											
2ZWR4A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWR5A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWR6A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWR7A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWR8A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWR9A	1	1	88	83	77	64	50	29	-	-	58
2ZWT1A	1	3	88	83	77	64	50	29	-	-	58
2ZWT2A	1½	1	115	109	104	94	81	64	40	-	67
2ZWT3A	1½	3	115	109	104	94	81	64	40	-	67
2ZWT4A	2	1	122	115	109	98	84	68	46	10	72
2ZWT5A	2	3	122	115	109	98	84	68	46	10	72
2ZWT6A	3	1	170	166	162	146	130	110	82	35	74
2ZWT7A	3	3	170	166	162	146	130	110	82	35	74
316 le Sans tache Modèles D'acier											
2ZWT8A	1/3	1	41	37	34	25	10	-	-	-	44
2ZWT9A	1/2	1	67	63	57	40	10	-	-	-	44
2ZWU1A	1/2	3	67	63	57	40	10	-	-	-	44
2ZWU2A	3/4	1	72	67	63	53	41	22	-	-	55
2ZWU3A	3/4	3	72	67	63	53	41	22	-	-	55
2ZWU4A	1	1	88	83	77	64	50	29	-	-	58
2ZWU5A	1	3	88	83	77	64	50	29	-	-	58
2ZWU6A	1½	1	115	109	104	94	81	64	40	-	67
2ZWU7A	1½	3	115	109	104	94	81	64	40	-	67
2ZWU8A	2	1	122	115	109	98	84	68	46	10	72
2ZWU9A	2	3	122	115	109	98	84	68	46	10	72
2ZWX1A	3	1	170	166	162	146	130	110	82	35	74
2ZWX2A	3	3	170	166	162	146	130	110	82	35	74

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Dimensions (Pouces)

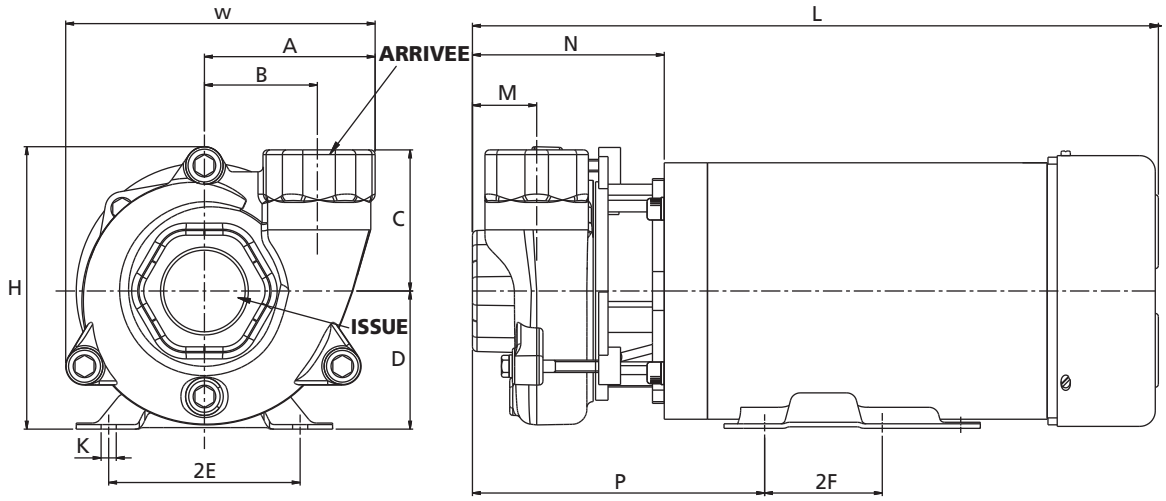


Figure 2 - Dimensions

Modèle	ISSUE (NPT)	ARRIVEE (NPT)	N	L†	D	2E	2F	K	P	H	B	A	C	M	W†
Fonte Modèles															
2ZWN9A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWP1A, 2ZWP2A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWP3A, 2ZWP4A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWP5A, 2ZWP6A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWP7A, 2ZWP8A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWP9A, 2ZWR1A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWR2A, 2ZWR3A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00
Bronze Modèles															
2ZWR4A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWR5A, 2ZWR6A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWR7A, 2ZWR8A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWR9A, 2ZWT1A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWT2A, 2ZWT3A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWT4A, 2ZWT5A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWT6A, 2ZWT7A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00
316 le Sans tache Modèles D'acier															
2ZWT8A	1″	3/4″	3.75	13.75	3.50	4.88	3.00	0.34	6.31	6.56	1.88	2.63	1.88	1.44	5.85
2ZWT9A, 2ZWU1A	1¼″	1″	3.75	13.62	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.60
2ZWU2A, 2ZWU3A	1¼″	1″	3.75	14.50	3.50	4.88	3.00	0.34	6.32	6.88	2.09	3.00	2.38	1.38	6.61
2ZWU4A, 2ZWU5A	1½″	1¼″	3.90	15.00	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWU6A, 2ZWU7A	1½″	1¼″	3.90	14.40	3.50	4.88	3.00	0.34	6.40	6.65	2.03	3.18	2.50	1.41	7.15
2ZWU8A, 2ZWU9A	1½″	1¼″	4.65	15.50	3.50	4.88	3.00	0.34	7.20	7.17	2.76	3.91	3.50	1.57	7.45
2ZWX1A, 2ZWX2A	2″	1½″	4.78	17.50	3.50	4.88	3.00	0.34	7.34	7.16	2.88	4.25	3.50	1.59	8.00

NOTEZ : Toutes les dimensions ont une tolérance (d'ou-) 1/8″.
(†) Cette dimension peut varier en raison des spécifications de fabricant automobile.
Le chauffeur automobile est soumis aux changements sans notification.

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Modèles de Fonte: 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A
Modèles de Bronze: 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A
316 Modèles d'Acier inoxydable: 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

L'Information générale de Sécurité

a lu s'il vous plaît ceci avant d'installer ou la pompe d'opération. Cette information est pourvu à la SECURITE et EMPECHER PROBLEMES D'EQUIPEMENT. Pour aider reconnaître cette information, observer les symboles suivants :

NOTE : Indique des instructions spéciales qui sont importantes mais pas apparenté aux dangers.

IMPORTANT : Indique des facteurs intéressés avec l'assemblée, l'installation,l'opération, ou l'entretien qui pourrait avoir pour résultat des dommages à la machine ou à l'équipement si négligé.

⚠ ATTENTION ***Avertit des dangers qui fera ou peuvent causer la blessure ou les dommages depropriété personnels mineurs si négligé.***

⚠ AVERTISSEMENT ***Avertit des dangers qui peuvent causer la blessure personnelle sévère, la mort, ou lesdommages de propriété majeurs si négligé.***

⚠ DANGER ***Avertit des dangers qui causeront la blessure personnelle sérieuse, la mort, ou les dommages de propriété majeurs si négligé.***

1. On peut éviter par la plupart des accidents par l'utilisation du SENS COMMUN.

⚠ ATTENTION ***Ne pas porter des vetements desserré qui pourront etre embrouillé dans le pousseur ou d'autres parties mouvantes.Portez toujours la sécurité appropriée, le matériel, comme les verres de sécurité, quand. traiter la pompe ou bat.***

⚠ ATTENTION ***Les pompes développentla chaleur et la pression pendant l'opération. Laisser du temps pour refroidir les pompes avant de contrôler ou entretenir.***

2. Le personnel seulement qualifié doit installer, doit fonctionner, et doit réparerla pompe.

⚠ ATTENTION ***Tenir à distance des ouvertures de succion et décharge. Ne pas insérer de doigt dans la pompe avec le pouvoir connecté.***

⚠ DANGER ***Ne pas pomper de matériels hasardeux (inflammable, caustic,etc.) à moins que la pompe est conçue en particulier et est désignée pour les contrôler.***

3. Assurer que les poignées soulevant sont assurément attachées chaque fois avant de soulever.
4. Ne pas fonctionner la pompe sans les appareils de sécurité à sa place. Toujours remplacer les appareils de sécuritéqui ont été enlevés pendant le service ou la réparation.
5. Ne pas dépasser la recommandation du fabricant pour l'exécution maximum, comme ceci pourrait causer le moteur pour surchauffer.
6. Obtenir la pompe dans sa position d'opération donc 'il ne peut pas se renverser, ou tomber.

⚠ DANGER ***Ces pompes ne sont pas approuvées pour l'usage dans les piscines, les installations d'eau divertissantes, les fontaines décoratives, ou l'installation où le contact humain avec le liquide pompé est commun.***

7. L'opération contre une soupape de décharge fermée causera le maintien prématuré et l'échec de cachet sur n'importe quelle pompe, et sur le soi-apprêt pompe la chaleur développe peut causer la génération de vapeur qui peut résulter des pressions dangereuses. Il est recommandé qu'un haut commutateur de température de cas ou la soupape de soulagement de pression ait installé sur le corps de pompe ou entre le corps de pompe et n'importe quelles soupapes.

⚠ AVERTISSEMENT ***Pour réduire le risque de choc électrique, la pompe doit être convenablement fondé conformément aux Code Electriques Nationaux des Etats-Unis(NEC), ou le Code Electrique canadien (CEC) et tout état applicable, et tous codes et toutes ordonnances locales.***

⚠ AVERTISSEMENT ***Fonder déplacé annule la garantie. Pour réduire le risque de choc électrique, toujours débrancher la pompe de la source de pouvoir avant de contrôler ou entretenir. Verrouiller hors le pouvoir et l'étiquette.***

8. N'importe quelle installation éléctrique de pompes devrait être exécutée par un électricien qualifié.

⚠ AVERTISSEMENT ***Pour réduire le risque de choc électrique, toutes connexions d'installation éléctrique et jonction devraient être faites par Code Electriques Nationaux des Etats-Unis (NEC), ou le Code Electrique canadien (CEC) et l'état applicable ou la province et les codes locaux. Les conditions peuvent varier en fonction de l'usage et de l'emplacement.***

9. Si utilisant le tuyau ne bloque pas ou limite le tuyau de décharge, comme le tuyau de décharge peut fouetter sous la pression.

⚠ AVERTISSEMENT ***Cette pompe est conçue pour contrôler des matériels qui pourraient causer la maladie par l'exposition directe. Porter des vêtement protectifs suffisant quand il s'agit de travailler avec la pompe ou bat.***

10. Les produits retournés doivent être nettoyés, doivent être désinfecté, ou doivent être décontaminé comme nécessaire avant le chargement, d'assurer que les employés ne seront pas exposés aux dangers de santé. Toutes les lois et les règlements applicables s'appliqueront.

11. bronze/cuivre et bronze/cuivre ont ajusté des pompes qui peuvent contenir de premiers niveaux plus hauts que considérés sûrs pour les systèmes d'eau portatifs. Les divers pouvoirs publics ont déterminé que les alliages de cuivre menés ne devraient

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pas être utilisés dans les applications d'eau portatives. Pour les matériels d'alliage de cuivre de non-mené de construction, s'il vous plaît contactez l'usine.

Dayton Mfg Electrique. co. n'est pas responsable des pertes, de la blessure, ou de la mort qui résulte d'un échec pour observer ces précautions de sécurité, l'usage impropre ou l'abus de pompes ou d'équipement.

LE DEBALLAGE

Sur la réception de la pompe, il devrait être inspecté pour les dommages ou les manques. Si les dommages sont arrivés, classe une réclamation tout de suite avec le transporteur qui a livré la pompe. Si le manuel est enlevé de l'emballage, ne pas perdre ou égarer.

STOCKAGE

A court terme-les Pompes sont fabriquées pour l'exécution efficace suivant des périodes inopérantes courtes dans emmagasinage. Pour les meilleurs résultats, les pompes peuvent être retenues dans l'emmagasinage, comme l'usine s'est assemblée, dans une atmosphère sèche avec les températures constantes jusqu'à six mois.

A long terme- Pour l'emmagasinage de six mois , à vingt-quatre mois, les unités devraient être emmagasinées dans une température contrôlée, une clôture qui fournit la protection des éléments (la pluie, la neige, la poussière vent-soufflé, etc.), et dont la température peut être maintenue entre + 40° F et + 120° F. Si l'haute humidité prolongée est comptée être un problème, toutes les parties exposées devraient être inspectées avant l'emmagasinage et toutes surfaces qui ont la peinture grattée, endommagée, ou portée devraient être recouvertes avec une base d'eau, l'air sèche la peinture d'émail. Toutes surfaces devraient être alors vaporisées avec un pétrole de rouille-interdit.

La pompe devrait être emmagasinée dans son récipient d'expédition d'original. Au debut, tourne le pousseur à la main pour assurer le cachet et le pousseur tourne librement.

S'il est exigé que la pompe soit installée et soit essayée avant que l'emmagasinage à long terme commence, telle installation sera permise fourni :

1. La pompe ne soit pas installée pour plus d'un (mois.
2. Tout de suite sur l'achèvement satisfaisant du test, la pompe est enlevée, est séché à fond, est retassé dans le récipient d'expédition , et placé dans une température contrôlée.

L'INSTALLATION

BAT

Localiser la pompe comme proche à la source fluide comme possible, ainsi faisant la ligne de succion courte et directe comme possible. Attacher la ligne de succion bat à l'arrivée de pompe et à la décharge bat à la sortie de pompe. Un tuyau devrait être utilisé sur la décharge de pompe pour permettre de remplir le cas avec le liquide avant que la pompe soit commencée. La pompe n'amorcera pas à moins qu'elle soit rempli avec le liquide, ou le cachet mécanique . Faite une boucle de tuyau ou d'installations qui pourrait permettre des trous d'air formes. Utiliser L'enduit d'étanchéité de tuyau d'usage pour assurer les connexions de tuyau hermétiques. Soutenir le battre d'une manière indépendante de la pompe pour éviter des tensions excessives sur l'encaissage de pompe, qui pourrait causer la déviation du pousseur et l'échec de pompe possible.

Il est recommandé qu'une union et une soupape de portail (pas fourni) soit installé sur le côté de décharge de la pompe pour la convenance de service.

⚠ ATTENTION ***Ne pas utiliser une soupape de globe ou limiter le type de soupape à la décharge comme ils limiteront la capacité de la pompe.***

⚠ AVERTISSEMENT ***Cette unité n'est pas imperméable et n'est pas capable d' être immergé dans l'eau ou localisé dans autre mouille potentiellement des emplacements.***

Le moteur est conçu être utilisé dans un emplacement sec propre avec l'accès à une provision suffisante de refroidissement d'air. Pour les installations extérieures, le moteur doit être protégé par une couverture qui ne bloque pas le flux d'air.

LES CONNEXIONS ELECTRIQUES

1. L'installation éléctrique de moteur doit être conforme aux codes électriques locaux.
2. Utiliser le fil de taille suffisante pour empêcher la baisse de tension.
3. La pompe doit être sur une branche ou sépare le circuit, unifié ou le disjoncteur, protégé, avec un manuel débranche.
4. Connecter la provision électrique du commutateur aux terminaux des moteurs, suivant le diagramme d'installation éléctrique sur la plaque du moteur.

NOTE : Soyez sûr que les connexions aux terminaux des moteurs correspondent avec la tension appliquée.

Vérifier les graphiques d'installation éléctrique et fusible avant de connecter des fils pour entretenir la ligne. Assurer que la tension et la fréquence de la provision actuelle électrique sont d'accord avec ceux sur la plaque moteur. Si en doute, controler avec l'entreprise.

Quelques pompes sont équipées avec trois moteurs de phase. Trois moteurs de phase exigent des démarreurs magnétiques, et peut courir dans toutes les direction, en fonction de comment ils sont connectés à l'alimentation.

FONDANT de MOTEUR

cette pompe doit être installée et doit être maintenue conformément au code Electrique National ou votre Etat et votre code électrique local. Il est exigé qu'une connexion permanente de sol ait faite à l'unité utilisant un conducteur de taille appropriée d'un tuyau d'eau souterrain en métal ou un avance fondé dans le panneau de service. Ne PAS connecter à l'alimentation électrique jusqu'à ce que l'unité soit fondé d'une façon permanente. Connecter le fil de sol au sol approuvé et connecter alors au terminal fourni.

FRANÇAIS

Modèles de Fonte: 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A
Modèles de Bronze: 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A
316 Modèles d'Acier inoxydable: 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

PRE-OPÉRATION

CONTROLER la POMPE ROTATION

TROIS PHASES : La rotation est indiquée par une flèche sur l'encaissage. La pompe ne devrait pas être fonctionnée en arrière ou dans la rotation inverse. Momentanément appliquer le pouvoir, pendant que l'arrière du moteur (en face de la fin de pompe), l'arbre moteur devrait tourner dans le sens des aiguilles d'une montre. Si le moteur fonctionne dans la mauvaise rotation, échanger n'importe quel deux des premiers fils et la rotation correcte résulteront.

L' INEXACTE

PHASE UNE - Dans l'événement peu probable que la rotation soit inexacte pour une pompe de phase une , contacter Dayton Mfg Electrique. Co.

LA SUCCION INONDEE AMORÇANT

Cette méthode d'apprêt d'une pompe est relativement simple. La source liquide est au-dessus localisée de la pompe et tout qu'est nécessaire d'amorcer la pompe est d'ouvrir la soupape de prise d'air ou le bouchon dans l'encaissage de pompe et craquer la soupape de portail dans la ligne de succion. La ligne de succion et la pompe devraient être lentement remplis jusqu'à ce qu'un ruisseau constant de liquide observé coule de la prise d'air. Après que la pompe fonctionne, il est recommandé que la soupape de prise d'air ou le bouchon soit encore ouvert pour assurer que tout air a été expulsé de l'encaissage de pompe.

⚠ ATTENTION ***Ne PAS commencer la pompe jusqu'à ce quelle l a été rempli avec l'eau.***

⚠ ATTENTION ***Les pompes centrifuges ne devraient jamais être commencées ou ne doivent pas etre sèches. L'opération d'une pompe sèche causera marquer du cachet mécanique, qui aura pour résultat l'échec de cachet prématuré. Pour empêcher la pompe d'etre sec, il devrait être amorcé avant de commencer.***

COMMENCEMMENT

Pour commencer la soupape de portail dans la ligne de décharge devrait être fermée, et devrait être ouvert peu à peu au fur et a mesure que le moteur approche en vitesse pleine, de cinq à dix seconde. Après que la pompe soit une fois dans l'opération pour que la décharge revêt complètement soit rempli, c'est alors inutile de fermer la soupape de portail au commencemment.

LE SERVICE SAISONNIER

pour sortir de service ;

1. Drainer le liquide de lapompe pour empêcher le gel et les dommages au corps de pompe. Il est recommandé qu'un bon inhibiteur de rouille soit mis dans la fin liquide pour empêcher la corrosion excessive. Garder le moteur sèche et couvert.

2. Pour drainer, enlever le bouchon d'égout qui est localisé au dessous de l'arrivée de la pompe. Drainer le tuyau d'arrivée à un point au dessous de la ligne de gelée. Tous autres tuyaux, qui pourraient être exposés aux températures glaciales, devrait être aussi drainé.
3. Enlever le bouchon d'apprêt. Ceci aidera le corps de pompe pour drainer en permettant de l'air pour entrer le cas.

Pour Placer la Pompe de retour dans le Service

1. Remplacer tous bouchons d'égout auparavant enlevé, utilisant le tuyau composé commun sur tous fils mâles.
2. Assurer que les lignes de succion et décharge ont été reconnectées et ont été resserrées.
3. Contrôler pour être certain que l'arbre de pompe tourne librement.
4. Vérifier avec la plaque de nom ce moteur a été configuré pour vos conditions de tension de système.
5. Primordial et le début.

Maintenance

⚠ AVERTISSEMENT ***Etre certain que l'unité est débranchée de la source de pouvoir avant de tenter d'entretenir ou enlever n'importe quels composants !***

L'ENLEVEMENT DE VIEILLE ASSEMBLEE DE CACHET

Doitetre assemblée de cachet mécanique (Ref. NON. 4 & 5) exiger la réparation, les bénéfices comme suit et réfère aux Figures 3 à 7.

IMPORTANT : Toujours remplacer la place de cachet et la tête de cachet pour garantir les correctes composants !

1. Enlever des boulons (Ref. No 11) connectant l'encaissage (Ref. Non. 9) à l'adaptateur (Ref. No.2).
2. Enlever l'encaissage.

⚠ ATTENTION ***Le soin devrait être pris pour ne pas pincer ou « raser » le joint d'o-anneau (Ref. Non. 8) entre l'adaptateur et l'encaissage.***

NOTE : L'arbre moteur doit être tenu en place pour enlever le pousseur . Le dos du moteur a l'entaille dans l'arbre(utilise le grand tournevis pour tenir) pousseur (Ref. Non. 7) dévisse CCW quand on regarde le devant de la pompe.

IMPORTANT : Le soin devrait être pris pour garantir que le même nombre et la même épaisseur de rondelles de cale de support (Ref. Non. 6) sont remplacé derrière le pousseur comme ils ont été enlevé. Les rondelles de cale de support sont directement localisées derrière le pousseur et deviennent détaché comme le pousseur est enlevé.

Pompes Centrifuges Doubles-proches de Dayton®

La Fonte, le Bronze et 316 Acier inoxydable

Maintenance (Continued)

L'INSTALLATION DE NOUVELLE

3. La tête de cachet (Ref. Non. 5) peut être maintenant tiré de l'arbre (voit la Figure 4).
4. Enlever l'adaptateur moteur (Ref. No 2) du moteur en enlevant les boulons d'adaptateur (Ref. No.3).
5. Utiliser une cheville en bois pour pousser hors la place de cachet (Ref. Non. 4) de l'adaptateur (Ref. Non. 2) (voir la Figure 5).

ASSEMBLEE DE CACHET

⚠ ATTENTION ***La précision Les visages carbone/en céramique sur le cachet mécanique sont facilement endommagés. Contrôler votre cachet de réparation soigneusement. Ne pas toucher les visages carbone/en céramique de cachet.***

IMPORTANT : Etre sûr que cette épaule d'arbre n'endommage pas de visage de carbone.

1. A fond nettoyer toutes surfaces de la cavité de place de cachet dans l'adaptateur (Ref. No.2).
2. En utilisant un tissu propre, essuyer la manche d'arbre et arbre et etre certain qu'ils sont parfaitement propres.

NOTE : Inspecter l'arbre moteur pour les égratignures ou les sillons en spirale. S'ils existent, remplace le moteur.

3. Mouiller la portion de caoutchouc de la nouvelle place de cachet (Ref. Non. 4) avec un revêtement léger d'eau savonneuse. En portant des gants ou l'utilisation propre d' un propre léger chiffon, appuyer la place de cachet directement dans le replis d'adaptateur. Utiliser la rondelle de carton (d'ordinaire fourni avec le nouveau cachet) placer sur la surface polie et utiliser un morceau de tringle de tuyau ou cheville pour appuyer fermement mais doucement. Eviter de gratter le visage en céramique blanc (voit la Figure6).
4. Liquider la rondelle de carton. Vérifier encore pour voir que cette surface en céramique est libre de terre et toutes autres particules étrangères et qu'il n'a pas été gratté ou a été endommagé
5. Mouiller la portion intérieur de caoutchouc de la nouvelle tête de cachet (Ref. Non. 5) avec un revêtement léger d'eau savonneuse. Glisser la tête sur l'arbre moteur avec la surface scellant (le carbone) faisant face à la place de cachet (voit la Figure 7). Ceci complète l'installation de cachet.

NOTE : Une période courte de « prise de bec » peut être nécessaire de fournir l'opération de cachet complètement résistante aux fuites.

6. Visser le pousseur (Ref. Non. 7) sur l'arbre. Utiliser l'entaille de tournevis à l'arrière d'arbre moteur (en face de la fin enfilée) resserrer impeller.

NOTE : Cela peut être nécessaire d'enlever le bouchon dans l'embout protecteur moteur pour exposer l'entaille. Si enlevé, être sûr de réinstaller le bouchon APRES la pompe que la soit complètement assemblée.

7. En remplacant les cales de support originales qui ont été fourni avec la pompe, la hauteur du pousseur devrait être réglée convenablement. La figure accompagnee de graphique Calcule 3 donnent l'adaptateur correct à la dimension de hauteur moteur pour l'exécution de pompe optimum. Après avoir installé, le contrôle pour voir si l'arbre tourne librement en tournant le pousseur . Si frottant ou la reliure est trouvée, enlevez le pousseur r et ajouter une cale de support (Ref. Non. 6) à l'arbre, alors revérifier. Répéter la procédure jusqu'à ce que tout frottement soit éliminé.
8. Placer l'o-anneau (Ref. Non. 8) sur l'adaptateur monte la bride. Attacher les boulons d'utilisation d'encaissage (Ref. No 11), faire attention pour ne pas pincer ou « raser » l'o-anneau. Comme l'encaissage est resserré, tourner périodiquement le pousseur de rotation pour vérifier l'intervention avec l'encaissage.

⚠ ATTENTION ***Le cachet produira le mineur traîne en tournant l'arbre moteur, mais le frottement n'importe où doit être d'autre éliminé ! Autrement, les dommages pour pomper le moteur de et/ou peut arriver.***

L'AJUSTEMENT DE CALE DE SUPPORT DU POUSSEUR

MODELE	POSITION "A"
2ZWR4A, 2ZWN9A, 2ZWT8A	0.634”-0.674”
2ZWR5A, 2ZWP1A, 2ZWT9A	0.742”-0.782”
2ZWR6A, 2ZWP2A, 2ZWU1A	
2ZWR7A, 2ZWR8A, 2ZWP3A,	
2ZWP4A, 2ZWU2A, 2ZWU3A	0.755”-0.795”
2ZWR9A, 2ZWP5A, 2ZWU4A	0.873”-0.913”
2ZWT1A, 2ZWP6A, 2ZWU5A	
2ZWT2A, 2ZWT3A, 2ZWP7A,	
2ZWP8A, 2ZWU6A, 2ZWU7A	0.874”-0.914”

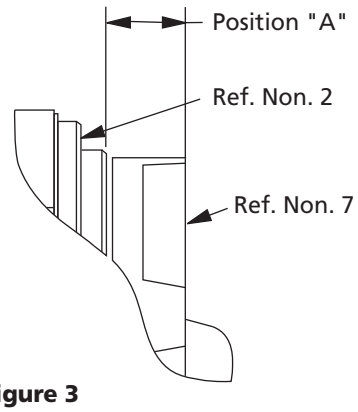


Figure 3

FRANÇAIS

Modèles de Fonte: 2ZWN9A, 2ZWP1A thru 2ZWP9A, 2ZWR1A thru 2ZWR3A
Modèles de Bronze: 2ZWR4A thru 2ZWR9A, 2ZWT1A thru 2ZWT7A
316 Modèles d'Acier inoxydable: 2ZWT8A, 2ZWT9A, 2ZWU1A thru 2ZWU9A, 2ZWX1A and 2ZWX2A

Sceller l'Enlèvement d'Assemblée et l'Installation (figures 4 à 7)

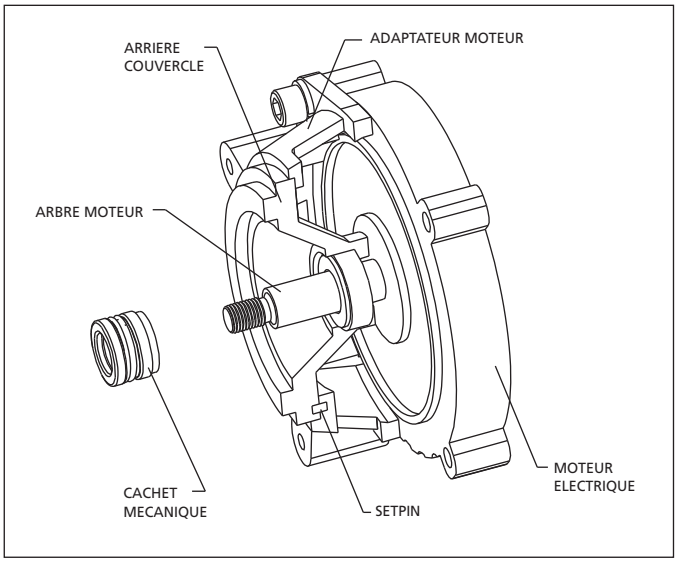


Figure 4 : l'Enlèvement du cache

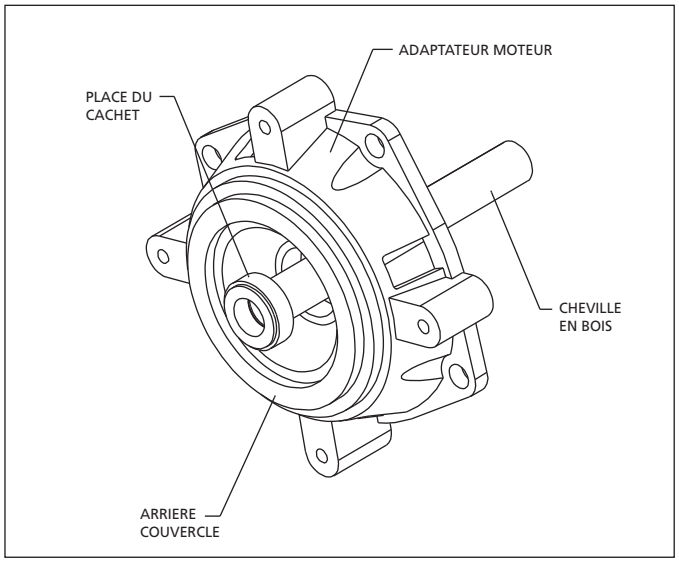


Figure 5 - Enlèvement de la Place du Cachet

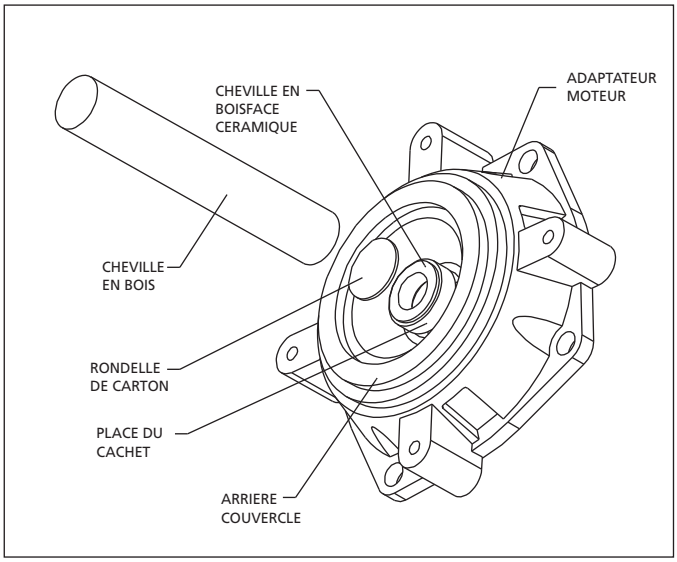


Figure 6 - Assemblée de la Place du Cachet

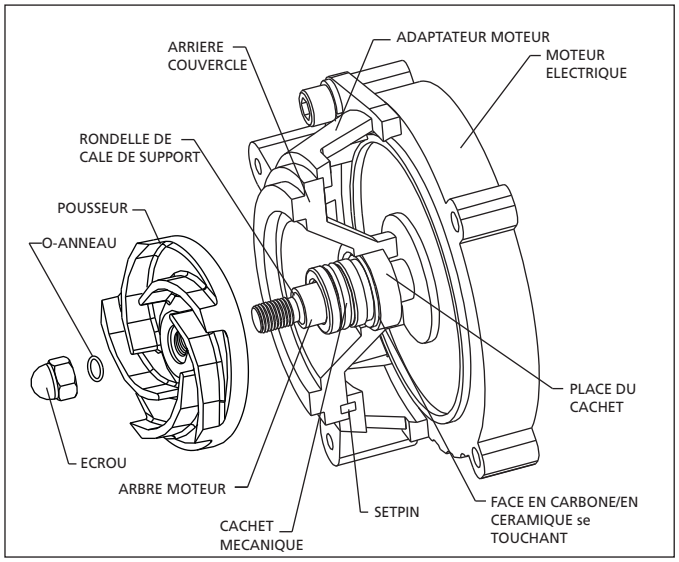


Figure 7 - l'Assemblée du Cachet et pousseur

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Pompes Centrifuges Doubles-proches de Dayton®

La Fonte, le Bronze et 316 Acier inoxydable

Tableau de dépannage

Symptôme	Les Cause(s) possible(s)	Action corrective
La pompe fonctionne mais aucun liquide.	1. La succion défectueuse bat 2. La pompe est localisé loin de la source de fluide 3. La soupape de portail est fermé 4. La passoire obstruée 5. pollution de la soupape de pied 6. Décharger la hauteur trop grande, ou longtemps	1. Remplacer le bat 2. Reloger la pompe 3. Ouvrir la soupape 4. Nettoyer ou remplacer la passoire 5. Nettoyer ou remplacer la soupape 6. Abaisser le point de décharge, raccourcir le bat
Pompe n'amorcera pas ou retiendra l'apogée après avoir fonctionné.	1. Aérer la fuite dans la ligne de succion 2. La soupape obstrué de pied ou la passoire 3. La soupape fuyant de pied	1. La réparation ou remplacement 2. Nettoyer ou remplacer 3. La réparation ou remplacement de la soupape de pied
Le débit est bas.	1. Battre est pollué ou endommagé 2. pousseur obstrué ou pousseur porté 3. Décharger la ligne limitée ou Mince 4. La restriction de plomberie	1. Nettoyer ou remplacer 2. Nettoyer ou remplacer 3. Déloger le bat ou remplacer 4. Enlever des restrictions
La pompe commence et arrête de pomper.	1. pousseur pollué 2. Le cachet mécanique défectueux. 3 Fuite dans la ligne de succion. 4. Fuite dans paye la soupape.	1. Nettoyer le pousseur et la pompe. 2. Remplacer le cachet. 3. Réparation ou remplacement de la ligne de succion. 4. Réparation ou remplacement la soupape de pied.
Le bruit excessif quand la pompe est en cours d'opération.	1. pompe non- securisé à la fondation de l'entreprise. 2. Bat n'a pas soutenu pour soulager la tension sur l'assemblée de la pompe. 3. ligne de succion limitée .	1. Obtenir la pompe convenablement. 2. Faire des ajustements nécessaires. 3. Nettoyer et corriger la ligne de succion.
Le liquide dégoutte du point où l'arbre entre dans l'encaissage de pompe, quand la pompe est pleine de liquide.	1. Le cachet mécanique endommagé	1. Remplacer (Voir le cachet mécanique 2. le remplacement)

FRANÇAIS

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24 heures par jour – 365 jours par an

s'il vous plaît fournissez les informations suivantes :
- Le nombre de modèle
- le numéro de série (si il y en a)
- la description des parties et le nombre selon les parties énumérées

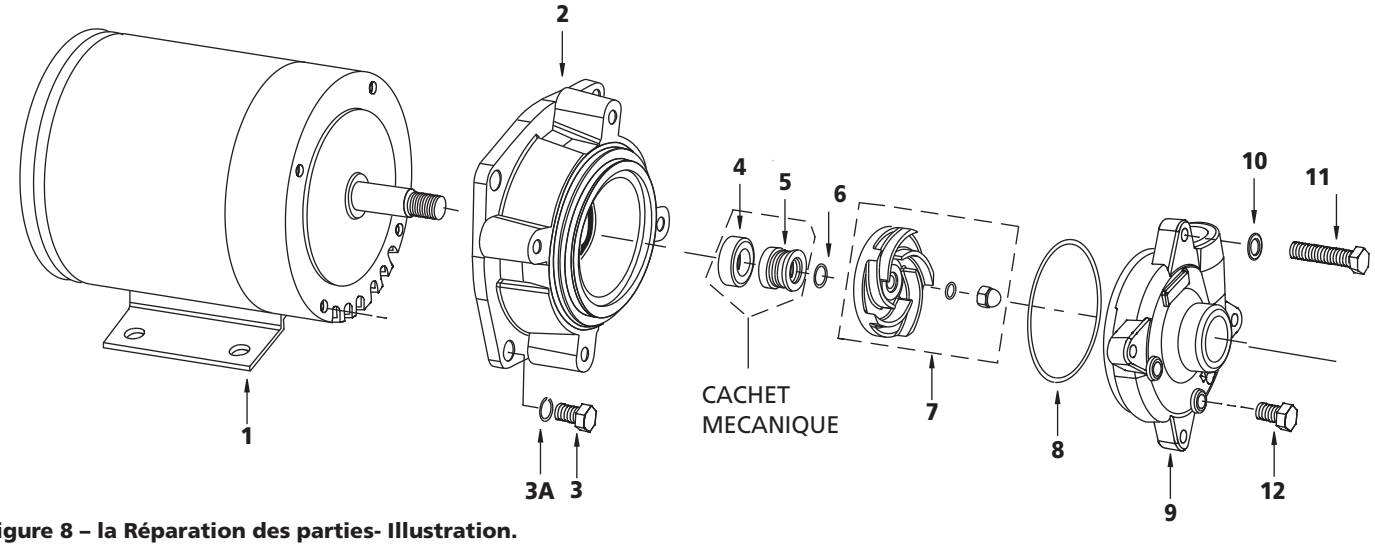


Figure 8 – la Réparation des parties- Illustration.

Les parties de réparation Enumérées pour la Fonte Pompe 2ZWN9A, 2ZWP1A à 2ZWP9A, 2ZWR1A à 2ZWR3A

Numéro de Réf.	Description	Numéros des pièces pour les modèles: 2ZWN9A	2ZWP1A 2ZWP2A	2ZWP3A 2ZWP4A	2ZWP5A 2ZWP6A	2ZWP7A 2ZWP8A	2ZWP9A 2ZWR1A	2ZWR2A 2ZWR3A	Quantité
1	Moteur***.	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Pomper l'Adapteur.	PPL2305CG	PPL2306CG	PPL2306CG	PPL2307CG	PPL2307CG	PPL2308CG	PPL2308CG	1
3	3/8-16 x 1" boulon, le Zinc plaqué.	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	3/8-16 x 3/4" boulon, le Zinc plaqué.	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	3/8", Frein d'écrou le Zinc plaqué.	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Buna-N le cachet mécanique et l'accouplement (std.).	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	L'option cachet disponible**.	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	†Viton le cachet mécanique et l'accouplement .	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	†Le cachet de carbure de silicium et l'accouplement.	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Turbine avec contre-écrou et joint torique	PPL2201CGG	PPL2202CGG	PPL2203CGG	PPL2204CGG	PPL2205CGG	PPL2206CGG	PPL2207CGG	1
8	Buna-N O-ANNEAU.	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
	†Viton O-ANNEAU.	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
9	Pomper l'encaissage.	PPL2101CG	PPL2102CG	PPL2102CG	PPL2103CG	PPL2103CG	PPL2104CG	PPL2105CG	1
10	Frein d'écrou l'Acier, Zinc plaqué*	PPL3201G	PPL3201G	PPL3201G	PPL3201G	PPL3201G	-	-	4
	Frein d'écrou, l'Acier, Zinc plaqué*.	-	-	-	-	-	PPL3203G	PPL3203G	3
11	Le boulon de tête de Sort de 5/16-18, l'Acier, Zinc plaqué*.	PPL3104G	PPL3104G	PPL3104G	PPL3106G	PPL3106G	N/A	N/A	4
	7/16-14 boulon de tête de sort Long, l'Acier, Zinc plaqué*.	N/A	N/A	N/A	N/A	N/A	PPL3112G	PPL3114G	2
	7/16-14 boulon de tête de sort Court, l'Acier, Zinc plaqué*.	N/A	N/A	N/A	N/A	N/A	PPL3108G	PPL3110G	1
12	Le bouchon de tuyau, Zinc plaqué*.	PPL3501G	PPL3501G	PPL3501G	PPL3501G	PPL3501G	-	-	2
	Le bouchon de tuyau, Zinc plaqué*.	-	-	-	-	-	PPL3504G	PPL3504G	1

(*) L'article de matériel Standard, disponible localement.
(†) Facultatif.
(***) Le Conducteur est assujetti au changement sans la notification ; voir l'étiquette sur le conducteur pour les véritables spécifications.
SS = l'Acier Inoxydable.
(**) **Note :** Le Cachet de Viton et Buna-N a du carbone sur les faces en céramique.
Les cachets de carbure de silicium ont les beuglements de Viton.
Tous cachets ont 316 SS composants en métal.

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- le numéro de série (si il y en a)
- la description des parties et le nombre selon les parties énumérées

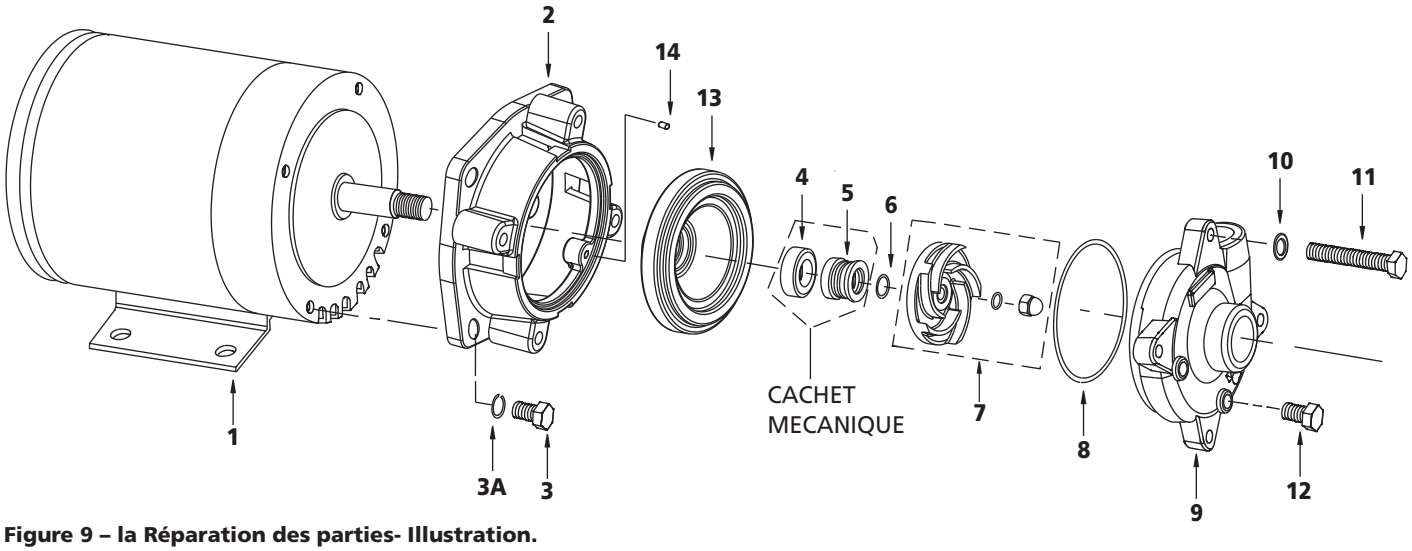


Figure 9 – la Réparation des parties- Illustration.

Les parties de réparation Enumérées pour la Bronze Pompe 2ZWR4A à 2ZWR9A, 2ZWT1A à 2ZWT7A

Numéro de Réf.	Description	Numéros des pièces pour les modèles: 2ZWR4A	2ZWR5A 2ZWR6A	2ZWR7A 2ZWR8A	2ZWR9A 2ZWT1A	2ZWT2A 2ZWT3A	2ZWT4A 2ZWT5A	2ZWT6A 2ZWT7A	Quantité
1	Moteur***.	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Pomper l'Adapteur.	PPL2309CG	PPL2310CG	PPL2310CG	PPL2311CG	PPL2311CG	PPL2312CG	PPL2312CG	1
3	3/8-16 x 1" boulon, le Zinc plaqué.	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	3/8-16 x 3/4" boulon, le Zinc plaqué.	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	3/8", Frein d'écrou le Zinc plaqué.	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Buna-N le cachet mécanique et l'accouplement (std.).	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	L'option cachet disponible**.	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	†Viton le cachet mécanique et l'accouplement .	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	†Le cachet de carbure de silicium et l'accouplement.	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Turbine avec contre-écrou et joint torique	PPL2201BGG	PPL2202BGG	PPL2203BGG	PPL2204BGG	PPL2205BGG	PPL2206BGG	PPL2207BGG	1
8	Buna-N O-ANNEAU.	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
	†Viton O-ANNEAU.	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
9	Pomper l'encaissage.	PPL2101BG	PPL2102BG	PPL2102BG	PPL2103BG	PPL2103BG	PPL2104BG	PPL2105BG	1
10	Frein d'écrou l'Acier, Zinc plaqué*	PPL3201G	PPL3201G	PPL3201G	PPL3201G	PPL3201G	-	-	4
	Frein d'écrou, l'Acier, Zinc plaqué*.	-	-	-	-	-	PPL3203G	PPL3203G	3
11	Le boulon de tête de Sort de 5/16-18, l'Acier, Zinc plaqué*.	PPL3104G	PPL3104G	PPL3104G	PPL3106G	PPL3106G	N/A	N/A	4
	7/16-14 boulon de tête de sort Long, l'Acier, Zinc plaqué*.	N/A	N/A	N/A	N/A	N/A	PPL3112G	PPL3114G	2
	7/16-14 boulon de tête de sort Court, l'Acier, Zinc plaqué*.	N/A	N/A	N/A	N/A	N/A	PPL3108G	PPL3110G	1
12	Le bouchon de tuyau, le Cuivre*	PPL3503G	PPL3503G	PPL3503G	PPL3503G	PPL3503G	-	-	2
	le bouchon de Tuyau, le Cuivre*	-	-	-	-	-	PPL3506G	PPL3506G	1
13	l'épingle de Rouleau	PPL2315BG	PPL2316BG	PPL2316BG	PPL2317BG	PPL2317BG	PPL2318BG	PPL2318BG	1
14	arrière couvercle	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	2

(*) L'article de matériel Standard, disponible localement.
(†) Facultatif.
(***) Le Conducteur est assujetti au changement sans la notification ; voir l'étiquette sur le conducteur pour les véritables spécifications.
SS = l'Acier Inoxydable.
(**) **Note :** Le Cachet de Viton et Buna-N a du carbone sur les faces en céramique.
Les cachets de carbure de silicium ont les beuglements de Viton.
Tous cachets ont 316 SS composants en métal.

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Pour Réparer des Parties, appelez 1-800-Grainger.

24 heures par jour – 365 jours par an

s'il vous plaît fournissez les informations suivantes :
- Le nombre de modèle
- le numéro de série (si il y en a)
- la description des parties et le nombre selon les parties énumérées

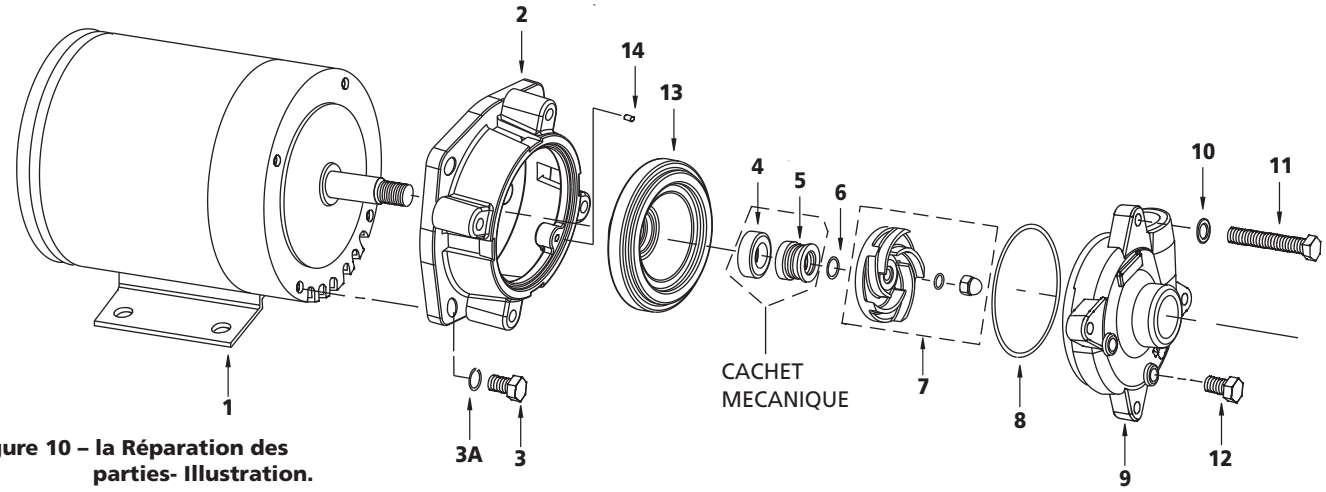


Figure 10 – la Réparation des parties- Illustration.

Les parties de réparation Enumérées pour la 316 le Sans tache Modèles D'acier Pompe 2ZWT8A, 2ZWT9A, 2ZWU1A à 2ZWU9A, 2ZWX1A and 2ZWX2A

Numéro de Réf.	Description	Numéros des pièces pour les modèles: 2ZWT8A	2ZWT9A 2ZWU1A	2ZWU2A 2ZWU3A	2ZWU4A 2ZWU5A	2ZWU6A 2ZWU7A	2ZWU8A 2ZWU9A	2ZWX1A 2ZWX2A	Quan-tité
1	Moteur***.	PP2LTAA21SBG	PP2LTAB21SBG/ PP2LTAB23SCG	PP2LTAC21SBG/ PP2LTAC23SCG	PP2LTAD21SBG/ PP2LTAD23SCG	PP2LTAE21SBG/ PP2LTAE23SCG	PP2LTAF21TBG/ PP2LTAF23TCG	PP2LTAG21TBG/ PP2LTAG23TCG	1
2	Pomper l'Adapteur.	PPL2309CG	PPL2310CG	PPL2310CG	PPL2311CG	PPL2311CG	PPL2312CG	PPL2312CG	1
3	3/8-16 x 1" boulon, le Zinc plaqué.	PPL3101G	PPL3101G	PPL3101G	PPL3101G	PPL3101G	N/A	N/A	4
	3/8-16 x 3/4" boulon, le Zinc plaqué.	N/A	N/A	N/A	N/A	N/A	PPL3103G	PPL3103G	4
3A	3/8", Frein d'écrou le Zinc plaqué.	PPL3207G	PPL3207G	PPL3207G	PPL3207G	PPL3207G	N/A	N/A	4
4 & 5	Viton le cachet mécanique et l'accouplement (std.).	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	PPL3306G	1
	L'option cachet disponible**.	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	PPL3305G	1
	†Buna-N le cachet mécanique et l'accouplement .	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	PPL3307G	1
6	†Le cachet de carbure de silicium et l'accouplement.	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	PPL3206G	1
7	Turbine avec contre-écrou et joint torique	PPL2201SGG	PPL2202SGG	PPL2203SGG	PPL2204SGG	PPL2205SGG	PPL2206SGG	PPL2207SGG	1
8	Viton O-ANNEAU.	PPL3402G	PPL3404G	PPL3404G	PPL3406G	PPL3406G	PPL3408G	PPL3408G	1
	†Buna-N O-ANNEAU.	PPL3401G	PPL3403G	PPL3403G	PPL3405G	PPL3405G	PPL3407G	PPL3407G	1
9	Pomper l'encaissage.	PPL2101SG	PPL2102SG	PPL2102SG	PPL2103SG	PPL2103SG	PPL2104SG	PPL2105SG	1
10	Frein d'écrou, 316 SS*	PPL3202G	PPL3202G	PPL3202G	PPL3202G	PPL3202G	-	-	4
	Frein d'écrou, 316 SS*	-	-	-	-	-	PPL3204G	PPL3204G	3
11	le boulon de tête de Sort de 5/16-18, est à la tête du verrou, 316 SS*	PPL3105G	PPL3105G	PPL3105G	PPL3107G	PPL3107G	N/A	N/A	4
	7/16-14 le Long sort sont à la tête du verrou, 316 SS*	N/A	N/A	N/A	N/A	N/A	PPL3113G	PPL3115G	2
	7/16-14 le sort Court sont à la tête du verrou, 316 SS*	N/A	N/A	N/A	N/A	N/A	PPL3109G	PPL3111G	1
12	le bouchon de Tuyau, 316 SS	PPL3502G	PPL3502G	PPL3502G	PPL3502G	PPL3502G	-	-	2
	le bouchon de Tuyau, 316 SS	-	-	-	-	-	PPL3505G	PPL3505G	1
13	l'épingle de Rouleau	PPL2315SG	PPL2316SG	PPL2316SG	PPL2317SG	PPL2317SG	PPL2318SG	PPL2318SG	1
14	arrière couvercle	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	PPL3608G	2

(*) L'article de matériel Standard, disponible localement.
(†) Facultatif.
(***) Le Conducteur est assujetti au changement sans la notification ; voir l'étiquette sur le conducteur pour les véritables spécifications.
SS = l'Acier Inoxydable.
(**) **Note :** Le Cachet de Viton et Buna-N a du carbone sur les faces en céramique.
Les cachets de carbure de silicium ont les beuglements de Viton.
Tous cachets ont 316 SS composants en métal.

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Notes

Notes

Pompes Centrifuges Doubles-proches de Dayton®

La Fonte, le Bronze et 316 Acier inoxydable

GARANTIE LIMITÉE

GARANTIE DAYTON LIMITÉE À 1 AN. *LES POMPES À CENTRIFUGES DOUBLES-PROCHES DE DAYTON®, DONT LES MODÈLES SONT DÉCRITS DANS CE MANUEL, SONT GARANTIES PAR DAYTON ELECTRIC MFG. CO. (DAYTON) AUPRÈS DE L'UTILISATEUR ORIGINEL POUR TOUT DÉFAUT DE RÉALISATION OU MATÉRIEL SURVENANT DANS LES CONDITIONS NORMALES D'UTILISATION DANS L'ANNÉE SUIVANT LA DATE D'ACHAT. TOUT ÉLÉMENT RECONNU DÉFECTUEUX TANT AU NIVEAU DU MATÉRIEL QUE DE LA CONCEPTION ET RENVOYÉ À UN SERVICE APRÈS-VENTE AGRÉE PAR DAYTON, LES COÛTS DE TRANSPORTS ÉTANT PREPAYÉS, SERA, ET NE SERA QUE, RÉPARÉ OU REMPLACÉ, SELON LE CHOIX DE DAYTON. POUR TOUT RENSEIGNEMENT CONCERNANT LES PROCÉDURES DE RÉCLAMATION LIÉES `LA PRÉSENTE GARANTIE, SE REPORTER AUX « DISPOSITIONS PREMIÈRES » CI-DESSOUS. CETTE GARANTIE À DURÉE LIMITÉE DONNE À L'ACQUÉREUR DES DROITS JURIDIQUES SPÉCIFIQUES QUI PEUVENT VARIER SELON LES JURIDICTIONS.*

LIMITATION DE RESPONSABILITÉ. *DANS LES LIMITES D'APPLICATION DE LA JURIDICTION LOCALE, DAYTON DÉCLINE TOUTE RESPONSABILITÉ QUANT À D'ÉVENTUELS DOMMAGES. QUEL QUE SOIT LES CIRCONSTANCES, LA RESPONSABILITÉ DE DAYTON EST LIMITÉE À, ET N'EXCÈDERA PAS, LE PRIX D'ACHAT PAYÉ.*

DÉNI DE GARANTIE. *UN EFFORT DILIGENT A ÉTÉ FAIT DANS CETTE NOTICE POUR FOURNIR DES INFORMATIONS ET ILLUSTRATIONS PRECISES SUR LES PRODUITS; CEPENDANT, DE TELLES INFORMATIONS ET ILLUSTRATIONS N'ONT QU'UN BUT D'IDENTIFICATION ET N'EXPRIMENT NI N'IMPLIQUENT UNE GARANTIE QUE LES PRODUITS SONT COMMERCIALISABLES, CONVENABLES POUR UN BUT PARTICULIER, OU QUE LES PRODUITS SE CONFORMERONT NÉCESSAIREMENT AUX ILLUSTRATIONS OU AUX DESCRIPTIONS. EXCEPTION FAITE DE CE QUI SUIT, AUCUNE GARANTIE OU AFFIRMATION DE FAIT, EXPRIMÉ OU IMPLIQUÉ, AUTRE QUE CELLES EXPOSÉES DANS "LA GARANTIE LIMITÉE" CI-DESSUS NE SONT FAITES NI AUTORISÉES PAR DAYTON.*

Conseil Technique et Recommandations, Déni. *Malgré n'importe quelle pratique antérieure ou transactions ou coutume commerciale, les ventes n'incluront pas de conseil technique ou la conception de système ou l'aide. Dayton réfute toute obligation ou responsabilité liée à n'importe quelles recommandations non autorisées, avis ou conseil quant au choix, l'installation ou l'utilisation des produits.*

Autorisation du Produit. *De nombreuses juridictions ont des codes et règlements régissant les ventes, la construction, l'installation, et/ou l'utilisation de produits pour certains buts, qui peuvent varier de ceux des régions voisines. Bien que tout soit fait pour assurer que les produits Dayton observent de tels codes, Dayton ne peut garantir l'entière conformité ni être tenue responsable de la façon dont le produit est installé ou utilisé. Avant l'achat et l'utilisation d'un produit, passez donc en revue les conditions d'utilisation du produit ainsi que tous les codes et règlements nationaux et locaux en vigueur et assurez-vous que le produit, l'installation et l'utilisation les respecteront.*

Certains aspects des dénis de responsabilité ne sont pas applicables aux produits grand public; par exemple, (a) quelques juridictions ne permettent pas l'exclusion ou la limitation des dommages et intérêts fortuits ou consécutifs à l'usage, donc la susdite limitation ou l'exclusion peuvent ne pas s'appliquer à vous; (b) par ailleurs, quelques juridictions ne permettent pas de limitation sur la durée d'une garantie implicite, par conséquent la susdite limitation peut ne pas s'appliquer à vous ; enfin (c) conformément à la loi, pendant la période de cette Garantie Limitée, n'importe quelles garanties implicite de valeur commerciale implicite ou l'adéquation à un usage particulier applicable aux produits grand public achetés par des consommateurs, peuvent ne pas être exclues ou autrement déniées.

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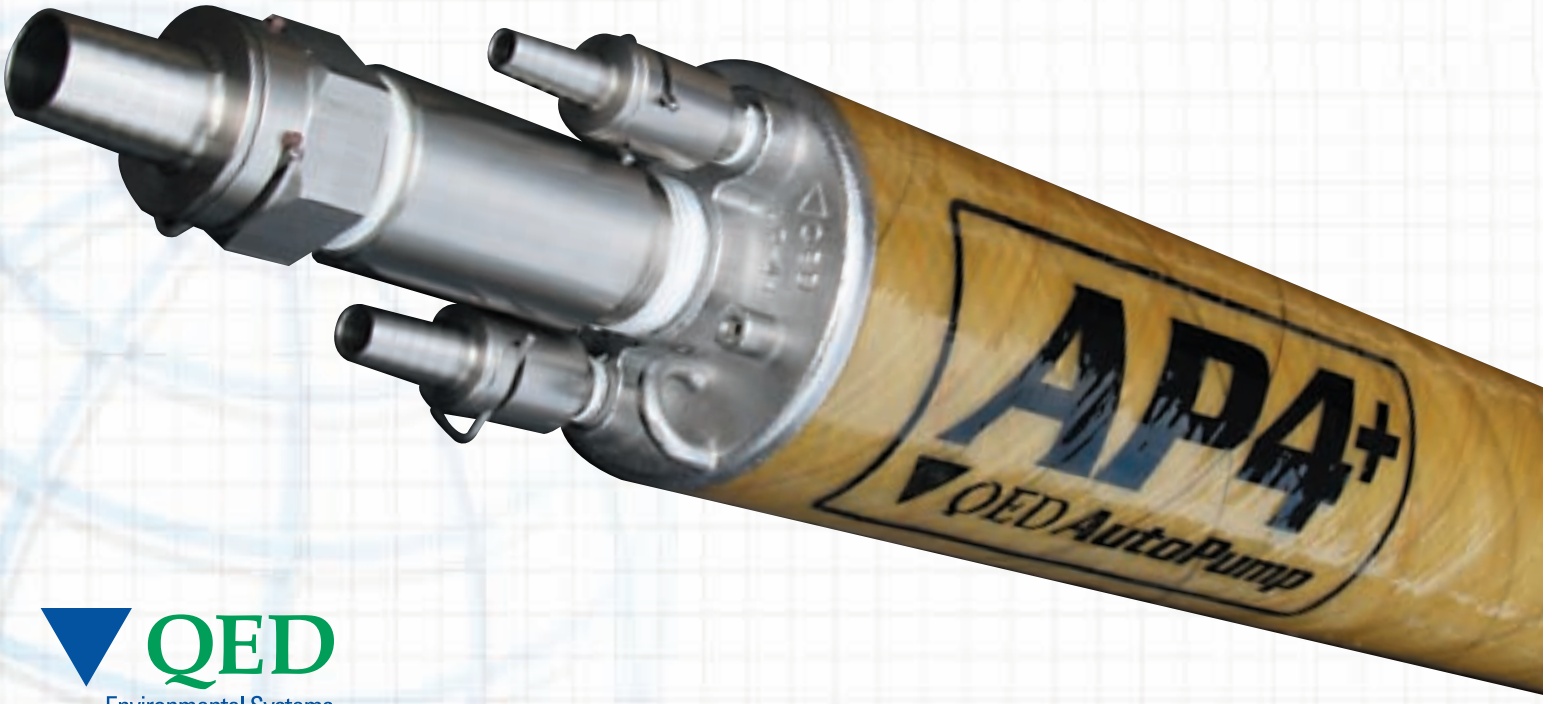
Disposition Première. *Un effort appréciable de confiance sera fait en ce qui concerne la réparation rapide ou tout autre ajustement relatif à n'importe quel produit qui s'avèrerait être défectueux dans le cadre de la garantie limitée. Pour tout produit à priori défectueux dans le cadre de la garantie limitée, écrivez tout d'abord ou appelez le négociant chez qui le produit a été acheté. Celui-ci donnera des directives supplémentaires. Si cela ne suffisait pas à résoudre le problème de façon satisfaisante, écrivez à Dayton à l'adresse ci-dessous, en donnant le nom et l'adresse du négociant, la date et le numéro de la facture du négociant, en décrivant la nature du défaut. Le titre et le risque de la perte passent de l'acheteur à la livraison au transporteur. Si le produit a été endommagé durant le transit, déposez une requête auprès du transporteur.*

Fabriqué pour Dayton Electric Mfg. Co., 100 Grainger Parkway, Lake Forest, Illinois 60045 États-Unis



The Next Generation AutoPump® AP4+

- Easier to Disassemble and Clean
- Same Proven AutoPump® Air Control Mechanism
- Upgraded Materials
- Expanded 5-year Warranty



QED
Environmental Systems
A TestAmerica Company
THE LEADER IN ENVIRONMENTAL TESTING

AutoPump®

The New AP4+ Builds

Same proven internal design, improved user features and value

The AutoPump® AP4 has been the gold standard for landfill and remediation pumping for over 20 years, proving itself #1 in reliability, long service life and the longest warranty in the industry. Although the original design has proven superior over time, QED has continued to refine it to make it even more reliable. The new AP4+ model now builds on the world's #1 choice for landfill and remediation pumping and makes it even better, to deliver more value to our customers. At the same time, the new AP4+ keeps the same internal mechanism design that AP4 users have depended on for over 20 years, along with the industry's leading pumping rates and low air consumption.

What makes the AP4+ even better?

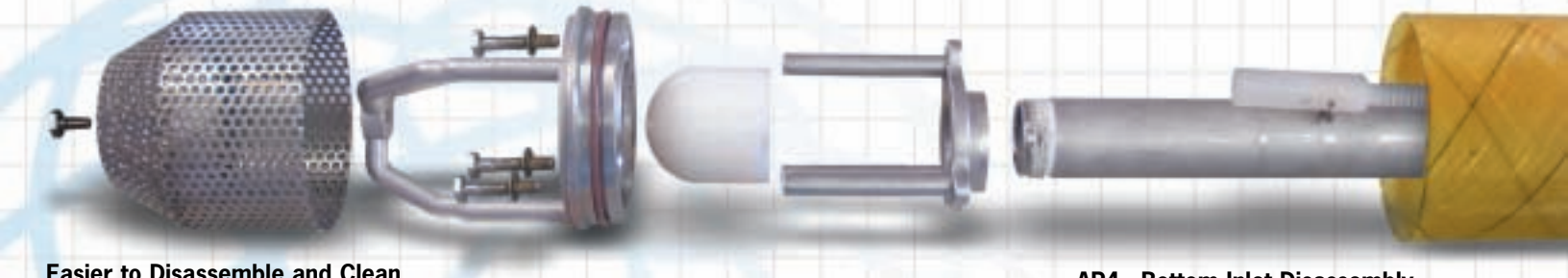
- Easier to clean
- Upgraded materials
- Expanded 5-year warranty terms



Removing the spring clip allows for easy disassembly of the float.



Smooth ID helps reduce the rate of solid buildup inside the casing.



AP4+ Bottom Inlet Disassembly

Easier to Disassemble and Clean

The AP4+ was made easier to clean by borrowing from our HammerHead® pump design, using 3 bolts to attach the pump inlet and open up the pump. This is easier than having to rotate the inlet multiple turns to unthread it from the center tube inside the pump, especially under field conditions of silt, deposits and coatings. Removing the inlet is also aided by the new, precision ID pump casing, ensuring a more controlled fit. The new pump casing's smoother internal surface has the added benefit of reducing the rate of buildup of solids and coatings inside in some cases. The Easy Fittings make it a snap to remove the tubing from the pump without cutting, and the float is now easily removed by pulling a clip.



Pull out the release clips.



Once the clips are removed, simply pull the connections apart.

Upgraded Materials

The new AP4+ features upgraded materials for many parts to further extend the service life of the pump and to broaden the range of conditions each model can be used in. All nonmetallic internal parts are now made of PVDF*; this is a high-grade engineering plastic with higher strength at elevated temperatures and extremely broad chemical resistance, including to acidic and oxidizing cleaning agents sometimes used for pump maintenance. All stainless steel parts have been upgraded to 304 grade or higher for improved corrosion resistance.

Expanded 5-year Warranty

The new and improved warranty, a straight 5-year warranty with no pro-rating, is proof of the AP4+'s successful history and continued improvements.

Of course, the new AP4+ is compatible with the AutoPump Family of Accessories, including:

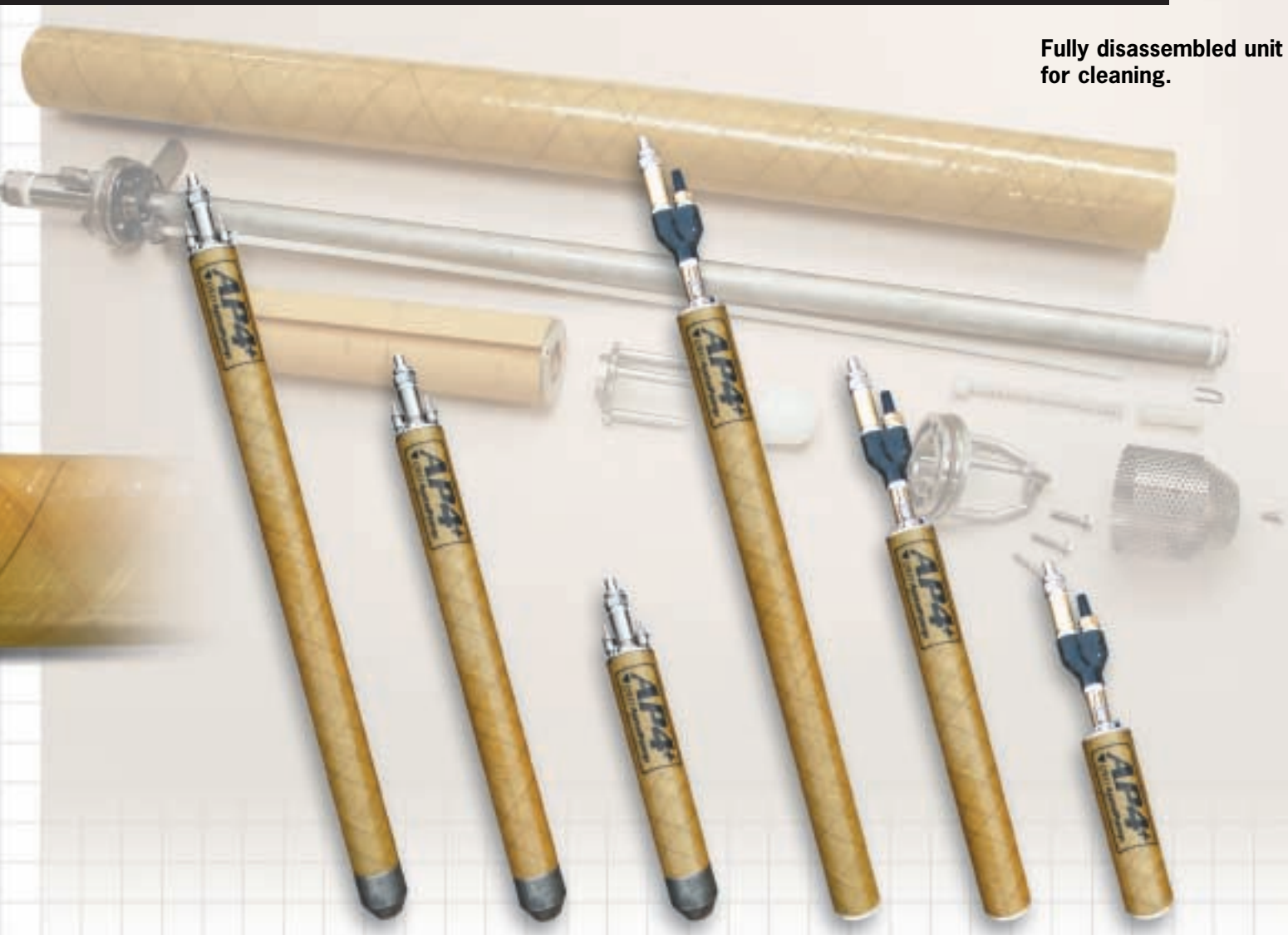
- Sheathed nylon pump tubing sets for maximum chemical resistance, reduced weight, less tangling and easier handling, another innovation lead by QED.
- QED's Easy Fittings for affordable, quick connection and removal of the pump from its tubing set, built to function easily even under high solids well conditions. These are now available pre-installed to pump and tubing so pump system installation just snaps together!
- QED's Easy Bolts for rapid access to flanged wellheads.
- The industry's widest range of wellhead completions to match your site so that pump installation goes smoothly. Custom options are available to fit your specific wellhead requirements.



See the AP4+ disassembled in two minutes with this video online: http://www.qedenv.com/AP4plus

* Except for the standard top-filling wye, which is made of acetal.

On A Tradition Of Success



Fully disassembled unit for cleaning.

AP4+ Series Pumps

	4" Pump Long AP4+B	4" Pump Short AP4+B	4" Pump LD AP4+B	4" Pump Long AP4+T	4" Pump Short AP4+T	4" Pump LD AP4+T
Fluid Inlet	Bottom	Bottom	Bottom	Top	Top	Top
Diameter	3.6 in. (9.1 cm) OD	3.6 in. (9.1 cm) OD	3.6 in. (9.1 cm) OD	3.6 in. (9.1 cm) OD	3.6 in. (9.1 cm) OD	3.6 in. (9.1 cm) OD
Length	51.4 in. (131 cm)	39.3 in. (100 cm)	27.5 in. (70 cm)	56.7 in. (144 cm)	45 in. (110 cm)	30.75 in. (78 cm)
Maximum Flow	14 gpm (69 Lpm)	13 gpm (49 Lpm)	7 gpm (26.5 Lpm)	10 gpm (38 Lpm)	9 gpm (34 Lpm)	6.4 gpm (24 Lpm)
Maximum Depth	250 ft. (76 m)	250 ft. (76 m)	250 ft. (76 m)	250 ft. (76 m)	250 ft. (76 m)	250 ft. (76 m)
Actuation Level	38.4 in. (98 cm)	26.7 in. (68 cm)	15.3 in. (39 cm)	53.3 in. (135 cm)	41.6 in. (106 cm)	27.4 in. (70 cm)

All pumps can handle temperatures of 180° F. Special models available for severe applications, including high temperatures, high viscosity and corrosive conditions. Visit our website at www.qedenv.com for specifications, flow rates and operating conditions, or contact QED directly at 1-800-624-2026.

Products Designed for Easy Field Operation

QED utilizes over 20 years of experience in air-powered pumping to find ways to improve the value we offer our customers, including helping reduce the total cost of pump installation, service and ownership.



Easy Wellheads

Wellheads in both flange and vacuum seal styles are easy to install because they are pre-equipped with your preferred fittings and accessories, such as pump cycle counters, check and shut-off valves, access ports, etc.



Easy Tubing with Easy Fittings

- Pump is easy to snap onto and off of the tubing with Easy Fittings without cutting the tubing.
- Our sheathed tubing is available cut-to-length and individually labeled, with Easy Fittings factory-installed.



Easy Bolt

Easy bolts make flanges easy to access with no wrenches or tools.



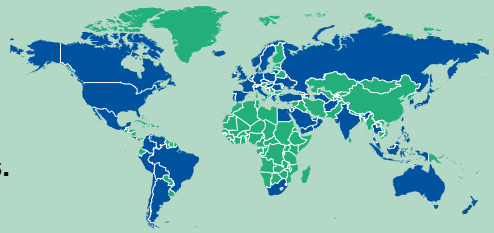
5-year Warranty

Expanded 5-year warranty for ease of mind.

Visit our website at www.qedenv.com for complete pump specifications and flow rates, or call us

800-624-2026

for prompt, expert assistance on your pumping project needs.





Every QED AutoPump system is backed by QED's unequaled reputation and dedication to quality and service. QED leads the industry in customer service, from our worldwide sales representation and our large services staffs in both Ann Arbor, Michigan and San Leandro, California, to our 24-hour, toll-free service hotline. Call or e-mail QED for prompt assistance with your unique project needs.

The World Leader in Air-Powered Pumps

For Remediation, Landfills and Groundwater Sampling

QED
Environmental Systems
A TestAmerica Company
THE LEADER IN ENVIRONMENTAL TESTING

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F: 510-346-0414
info@qedenv.com
www.qedenv.com

CODE 2345 04/10

SAFETY DATA SHEET

This safety data sheet was created pursuant to the requirements of:
OSHA 29 CFR 1910.1200

Document Type US - OSHA GHS **Revision date** 25-Nov-2019 **Version** 5

1. Identification

Product identifier

Product name Sodium Chloride (NaCl)

Other means of identification

Product No B1017

Recommended use of the chemical and restrictions on use

Recommended use This product is for research and development only

Restrictions on use No information available

Details of the supplier of the safety data sheet

Supplier Address
New England BioLabs
240 County Road
Ipswich, MA 01938
USA

Company Phone Number 978-927-5054, 800-632-5227 (toll free)
Telefax 978-921-1350
E-mail address info@neb.com

Emergency telephone number

24 Hour Emergency Phone Number 978-380-2125

2. Hazard(s) identification

Classification

This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Hazards not otherwise classified (HNOC)
Not applicable

Label elements

Hazard statements
Not a hazardous substance or mixture according to the Globally Harmonized System (GHS)

Appearance Colorless **Physical state** Liquid **Odor** Mild

Other information
May be harmful if swallowed

3. Composition/information on ingredients

Substance

Chemical name	CAS No	Weight-%	Trade secret
Sodium Chloride	7647-14-5	60 - 100	*

The product contains no substances which at their given concentration, are considered to be hazardous to health.

4. First-aid measures

Description of first aid measures

Inhalation Remove to fresh air.

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin contact Wash skin with soap and water.

Ingestion Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects, both acute and delayed

Symptoms No information available.

Indication of any immediate medical attention and special treatment needed

Note to physicians Treat symptomatically.

5. Fire-fighting measures

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media CAUTION: Use of water spray when fighting fire may be inefficient.

Specific hazards arising from the chemical No information available.

Explosion data
Sensitivity to mechanical impact None.
Sensitivity to static discharge None.

Special protective equipment for fire-fighters Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Ensure adequate ventilation.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so.

Methods for cleaning up Pick up and transfer to properly labeled containers.

7. Handling and storage

Precautions for safe handling

Advice on safe handling Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place.

8. Exposure controls/personal protection

Control parameters

Exposure Limits The following ingredients are the only ingredients of the product above the cut-off level (or level that contributes to the hazard classification of the mixture) which have an exposure limit applicable in the region for which this safety data sheet is intended or other recommended limit. At this time, the other relevant constituents have no known exposure limits from the sources listed here.

Appropriate engineering controls

Engineering controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Skin and body protection Wear suitable protective clothing.

Respiratory protection No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Colorless
Odor	Mild
Odor threshold	No information available

Property	**Values**	**Remarks • Method**
pH	No data available	None known
Melting point / freezing point	No data available	None known
Boiling point / boiling range	No data available	None known
Flash point	No data available	None known
Evaporation rate	No data available	None known
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air		None known
Upper flammability or explosive limits	No data available	
Lower flammability or explosive limits	No data available	
Vapor pressure	No data available	None known
Vapor density	No data available	None known
Relative density	No data available	None known
Water solubility	No data available	None known
Solubility in other solvents	No data available	None known
Partition coefficient	No data available	None known
Autoignition temperature	No data available	None known
Decomposition temperature	No data available	None known
Kinematic viscosity	No data available	None known
Dynamic viscosity	No data available	None known

Other information

Explosive properties	No information available
Oxidizing properties	No information available
Softening point	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Liquid Density	No information available
Bulk density	No information available

10. Stability and reactivity

Reactivity No information available.

Chemical stability Stable under normal conditions.

Possibility of hazardous reactions None under normal processing.

Conditions to avoid None known based on information supplied.

Incompatible materials None known based on information supplied.

Hazardous decomposition products None known based on information supplied.

11. Toxicological information

Information on likely routes of exposure

Product Information

Inhalation Specific test data for the substance or mixture is not available.

Eye contact Specific test data for the substance or mixture is not available.

Skin contact Specific test data for the substance or mixture is not available.

Ingestion May be harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms No information available.

Acute toxicity

Numerical measures of toxicity

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Sodium Chloride 7647-14-5	= 3 g/kg (Rat)	> 10 g/kg (Rabbit)	> 42 g/m^3 (Rat) 1 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation No information available.

Serious eye damage/eye irritation No information available.

Respiratory or skin sensitization No information available.

Germ cell mutagenicity No information available.

Carcinogenicity No information available.

Reproductive toxicity No information available.

STOT - single exposure No information available.

STOT - repeated exposure No information available.

Aspiration hazard No information available.

Other adverse effects No information available.

Interactive effects No information available.

12. Ecological information

Ecotoxicity .

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Sodium Chloride 7647-14-5	-	LC50: =12946mg/L (96h, Lepomis macrochirus) LC50: 5560 - 6080mg/L (96h, Lepomis macrochirus) LC50: 4747 - 7824mg/L (96h, Oncorhynchus mykiss) LC50: 6020 - 7070mg/L (96h, Pimephales promelas) LC50: =7050mg/L (96h, Pimephales promelas) LC50: 6420 - 6700mg/L (96h, Pimephales promelas)	-	EC50: =1000mg/L (48h, Daphnia magna) EC50: 340.7 - 469.2mg/L (48h, Daphnia magna)

Persistence and degradability No information available.

Bioaccumulation There is no data for this product.

Other adverse effects No information available.

13. Disposal considerations

Waste treatment methods

Waste from residues/unused products Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Do not reuse empty containers.

14. Transport information

DOT Not regulated

TDG Not regulated

MEX Not regulated

ICAO (air) Not regulated

IATA Not regulated

IMDG Not regulated

RID Not regulated

ADR Not regulated

ADN Not regulated

15. Regulatory information

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Complies
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories
Should this product meet EPCRA 311/312 Tier reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

CWA (Clean Water Act)
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

US State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations
This product does not contain any substances regulated by state right-to-know regulations

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. Other information

NFPA	**Health hazards** 0	**Flammability** 0	**Instability** 0	**Special Hazard** -
HMIS	**Health hazards** 1	**Flammability** 0	**Physical hazards** 0	**Personal protection** X

Key or legend to abbreviations and acronyms used in the safety data sheet

Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

Key literature references and sources for data used to compile the SDS

Agency for Toxic Substances and Disease Registry (ATSDR)
U.S. Environmental Protection Agency ChemView Database
European Food Safety Authority (EFSA)
EPA (Environmental Protection Agency)
Acute Exposure Guideline Level(s) (AEGL(s))
U.S. Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act
U.S. Environmental Protection Agency High Production Volume Chemicals
Food Research Journal
Hazardous Substance Database
International Uniform Chemical Information Database (IUCLID)
Japan GHS Classification
Australia National Industrial Chemicals Notification and Assessment Scheme (NICNAS)
NIOSH (National Institute for Occupational Safety and Health)
National Library of Medicine's ChemID Plus (NLM CIP)
National Library of Medicine's PubMed database (NLM PUBMED)
National Toxicology Program (NTP)
New Zealand's Chemical Classification and Information Database (CCID)
Organization for Economic Co-operation and Development Environment, Health, and Safety Publications
Organization for Economic Co-operation and Development High Production Volume Chemicals Program
Organization for Economic Co-operation and Development Screening Information Data Set
RTECS (Registry of Toxic Effects of Chemical Substances)
World Health Organization

Prepared by Environmental, Health and Safety
978-927-5054

Revision date 25-Nov-2019

Revision note SDS is valid 3 years from revision date. Contact info@neb.com for latest revision.

Disclaimer

IMPORTANT: The information in this SDS is provided in good faith based on our knowledge as of the issue date (or subsequent revision date, if any), and is to be used only as a guide. This SDS does not constitute a guarantee (express or implied) of any kind and we make no warranties or merchantability or fitness for a particular purpose. This information relates only to the designated product as shipped and may not be valid if the product is used in combination with any other materials or is not used in accordance with our instructions. It is the responsibility of the buyer/user to ensure that its activities comply with all applicable governmental requirements. Since conditions of use of the product are not under the control of New England Biolabs, it is the duty of the buyer/user to determine the necessary conditions for the safe use of the product. New England Biolabs will not be liable for any damages resulting from handling or contact with the product.

End of Safety Data Sheet

SAFETY DATA SHEET
TersOx™ Microbe

Revision date: 2019-06-10
Version 1.0

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name: TersOx™ Microbe

Synonyms: Non-pathogenic, naturally occurring microorganisms absorbed on wheat bran and corn gluten

Product Form: Mixture

Recommended use of the chemical and restrictions on use

Recommended Use: Remediation of contaminated groundwater and soils

Restrictions on Use: Use as recommended by the label

Details of the supplier and of the safety data sheet

Supplier
Tersus Environmental, LLC
1116 Colonial Club Rd
Wake Forest, NC 27587
Phone: +1-919-453-5577
Email: info@tersusenv.com

Contact Person
David F. Alden
Phone: +1-919-453-5577 x2002
Email: david.alden@tersusenv.com

Emergency telephone number

For leak, fire, spill or accident emergencies, call:

+1-919-453-5577 (Tersus Office Hours, 8:00 AM to 5:00 PM Eastern)
+1-800-424-9300 (Chemtrec 24 Hour Service – Emergency Only)
+1-703-527-3887 (Chemtrec Outside United States 24 Hour Service – Emergency Only)
+1-919-638-7892 Gary M. Birk (Outside office hours)

2. HAZARD IDENTIFICATION

Relevant identified uses of the substance or mixture

Hazard Classification	Category	H-statement
Acute toxicity, Inhalation	Not Classified	
Acute toxicity, Oral	Not Classified	
Acute toxicity, Dermal	Not Classified	
Skin irritant, (category 2)	May cause skin irritation	H315
Eye irritant (category 2A)	Causes serious eye irritation	H319
Mutagenicity	Unknown	
Carcinogenicity	Unknown	
Reproductive toxicity	Unknown	

Label elements
Hazard Pictograms



Signal word Warning

Hazard Statements Causes skin irritation (H315)
Causes serious eye irritation (H319)

Precautionary statements

P264 – Wash thoroughly after handling.
P280 – Wear protective gloves, clothing, eye, and face protection.
P302 + P352 – IF ON SKIN: Wash with soap and plenty of water.
P305 + P351 + P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332 + P313 – If skin irritation occurs: Get medical advice/attention.
P362 + P364 – Take off contaminated clothing and wash it before reuse.

Further information Crystalline silica is a known cause of silicosis (a non-cancerous lung disease).
Prolonged and/or repeated inhalation must be avoided
Persons who have a compromised immune system or a history of severe allergic response should avoid contact and/or breathing dust or mist from product handling or manufacturing processes.

Other hazards

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Formula Mixture

Hazardous components

Chemical Name	Concentration (%)	CAS Number
Dolomite	<45	16389-88-1
Crystalline Silica	<0.4	14808-60-7

Non-hazardous components

Chemical Name	Concentration (%)	CAS Number
Wheat Bran		116469-86-4
Corn gluten		66071-96-3
Diatomaceous Earth		91053-39-3
Urea	1 – 3	57-13-6
Diammonium Phosphate	<1	7783-28-0

Synonyms are provided in Section 1.
Occupational exposure limits, if available, are listed in Section 8.

4. FIRST AID MEASURES

General Information	Check the vital functions. If unconscious place in recovery position and seek medical advice. In case of respiratory arrest, administer artificial respiration. Cardiac arrest: perform resuscitation. Victim conscious with labored breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Take victim to a doctor if irritation persists. Remove affected person from source of contamination.
Eye Contact	Product is a severe eye irritant. Direct contact with eyes must be avoided. In case of contact with eyes, flush eyes with low pressure water for at least 15 minutes. If irritation persists, seek medical attention.
Skin Contact	Product may cause skin irritation. Direct contact with skin should be avoided. In case of contact with skin, wash skin with soap and water. Remove contaminated clothing and wash.
Inhalation	May cause sensitization by inhalation in hypersensitive individuals. Avoid product handling which results in dust generation. If inhaled, remove from contaminated area to fresh air. Report situation. Seek medical attention if allergic response exhibited.
Ingestion	Ingestion of material may cause mouth and throat irritation and/or gastric disturbance. If swallowed, rinse mouth and throat with tap water. Drink water.
Most important symptoms and effects, both acute and delayed	Most important symptoms/effects, acute and delayed: Product is not listed with IARC, NTP, ACGIH or OSHA as a carcinogen.
Indication of any immediate medical attention and special treatment needed	If exposed or concerned, get medical advice and attention.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Dry chemical, carbon dioxide, chemical foam or water fog.
Specific Hazards Arising from the chemical or mixture	No special requirements. Organic dusts are a weak explosion hazard. Not hazardous under normal storage and use conditions.
Special Fire Fighting Procedures	Cool containers exposed to flames with water until well after the fire is out. Use water spray to reduce vapors. If risk of water pollution occurs, notify appropriate authorities. Avoid water in straight hose stream; will scatter and spread fire. Keep upwind. Do not inhale explosion and combustion gases. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Cool containers exposed to flames with water until well after the fire is out. Use water spray to reduce vapors. If risk of water pollution occurs, notify appropriate authorities. Avoid water in straight hose stream; will scatter and spread fire. Wear positive-pressure, self-contained breathing apparatus (SCBA) and chemical protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Provide enough ventilation. Advice for emergency responders: protective equipment see Section 8. Wear protective clothing as described in Section 8 of this safety data sheet.
First Aid:	In case of contact with skin, wash with soap and water. If symptoms occur, seek medical attention. In case of contact with eyes, rinse with plenty of water for at least 15 minutes and see an eye specialist if irritation persists. In case of inhalation, remove to fresh air. In case of ingestion, drink water. If symptoms occur, seek medical assistance.
Environmental Precautions	None
Methods for Containment and Clean Up	Spilled product should be removed immediately to avoid formation of dust

7. HANDLING AND STORAGE

Precautions for safe handling	Avoid creating dust. Adequately ventilate when handling this product. Provide eyewash capability. No special requirements. Contain with applicable regulations. Avoid contact with eyes. Avoid inhalation of vapors and spray/mist. Remove contaminated clothing immediately. Clean contaminated objects and areas thoroughly observing environmental regulations. Keep away from sources of ignition – No smoking. Handle in accordance with good industrial hygiene and safety procedures. Discharge into the environment must be avoided. Keep container tightly closed. Either local exhaust or general room ventilation is usually required.
Hygiene measures	Handle in accordance with good industrial hygiene and safety procedures. Use good personal hygiene practices.
Conditions for safe storage, including any incompatibilities	None

8. EXPOSRE CONTROL / PERSONAL PROTECTION

Control parameters

Exposure guidelines, ingredients with workplace control parameters.

Name	CAS-No	TLV (ACGIH)	PEL (OSHA)
Dolomite	Dolomite	Dolomite	Dolomite
Urea	<1 – 3	10 mg/m3 {3}*	15 mg/m3 {5}*
Diammonium Phosphate	< 1	10 mg/m3 {3}*	15 mg/m3 {5}*
Crystalline silica	< 0.4	0.1 mg/m3	0.1 mg/m3
Wheat bran		10 mg/m3 (nuisance dust)	
Corn gluten		10 mg/m3 (nuisance dust)	
Ground and dehydrated algae		10 mg/m3 (nuisance dust)	

* Specific limits not set for these chemicals. Limits are shown for Particles Not Otherwise Regulated (PNOR) or Particles Not Otherwise Classified (PNOC). First number is for total dust second number { } is for respirable dust.

Exposure Control

Protective equipment



Appropriate engineering controls	Provide adequate general and local exhaust ventilation. Observe any occupational exposure limits for the product or ingredients. Do not allow uncontrolled discharge of product into the environment.
Eye/face protection	The following protection should be worn: Safety glasses with shields, chemical splash goggles or face shield.
Respiratory protection	Dust mask or respirator for particle removal (NIOSH)
Hand protection	Neoprene. Vinyl, Rubber (natural, latex), Butyl rubber. Wear protective gloves made of the following material: Chemical-resistant, impervious gloves complying with an approved standard should be worn if a risk assessment indicates skin contact is possible. Polyvinyl chloride (PVC). Manufactured/tested in accordance with EN 374, Avoid the following conditions: Polyvinyl alcohol (PVA).
Other skin and body protection	Wear appropriate clothing to prevent any possibility of skin contact.
Hygiene measures	Wash promptly if skin becomes contaminated. Wash hands at the end of each work shift and before eating, smoking and using the toilet. When using do not eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Tan granular powder
Odor	Mild odor
Odor threshold	Information Not Available
pH	7 – 10 (1% suspension)
Melting point /Freezing Point	Information Not Available
Initial Boiling point and boiling point range	Does Not Apply
Flash Point	Does Not Apply
Evaporation rate	Does Not Apply
Flammability (solid; gas)	Information Not Available
Upper/lower flammability or explosive limits	Does Not Apply
Vapor pressure	Low
Vapor density	Does Not Apply
Relative density	Information Not Available
Solubility (ies)	<5%
Partition coefficient: n-octanol/water	Does Not Apply
Auto-ignition temperature	Information Not Available
Decomposition temperature	Information Not Available
Viscosity	Does Not Apply
Other Physical/Chemical Properties	N/A

10. STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions and use.
Chemical stability	Information not available
Possibility of hazardous reactions	Information not available
Conditions to avoid	Freezing or temperatures above 100°F (40°C)
Incompatible materials	Strong acids, bases, or oxidizers
Hazardous decomposition products	Information not available
Hazardous Polymerization	Information not available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Acute toxicity	Enzymes in this product are non-toxic (LD 50 >2 g/kg in rats). Inhalation of dust may cause respiratory allergy in susceptible individuals.
Skin Corrosion/Irritation	Mild
Serious Eye Damage/Irritation	Mild
Respiratory or Skin Sensitization	Dust may cause irritation or allergy in susceptible individuals. May cause respiratory allergy in susceptible individuals: sensitization (shortness of breath, wheezing, and labored coughing) take individual to emergency room.
Ingestion	May cause severe gastric disturbances, sore throat.
Germ Cell Mutagenicity	Information Not Available
Carcinogenicity	Information Not Available
Reproductive Toxicity	Information Not Available
Specific Target Organ Toxicity – Single Exposure	Information Not Available
Specific Organ Toxicity – Repeated Exposure	Information Not Available
Aspiration Hazard	Information Not Available
General Remarks	Product may contain <1% crystalline silica (CS) Crystalline silica probably carcinogenic. IARC has classified CS as probably carcinogenic for humans (2A). NTP lists CS as a substance which may reasonably be anticipated to be a carcinogen. CS is a known cause of silicosis (a non-cancerous lung disease).

12. ECOLOGICAL INFORMATION

Chemical Fate Information
Product is readily biodegradable in wastewater treatment systems.

Biodegradability
Readily degradable.

Persistence and degradability
Readily biodegradable

Bioaccumulative potential
Information not available

Mobility in Soil
Information not available

Other adverse effects
Information not available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods	Dispose according to federal, state and local laws. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Authority. Waste is suitable for incineration.

14. TRANSPORTATION INFORMATION

UN Number	Mixture not classified as Hazardous according to Regulation (EC) 1272/2008.
UN Proper Shipping Name	n/a
Transport Hazard Class	n/a
Packing Group (if applicable)	n/a
Environmental Hazards	n/a
Special Precautions for User	n/a
Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code	n/a
DOT Proper Shipping Name	Chemicals not otherwise indexed (NOI) non-hazardous.

15. REGULATORY INFORMATION

EU Directive 2000_54 regarding risks from biological agents: micro-organisms in Class 1 may be used without restriction.

WGK (Water Hazards Class): 0 non-hazardous to water.

All ingredients used are listed on the USEPA TSCA Inventory list.

Canadian WHMIS: Toxic Class D2B (eye irritant)

16. OTHER INFORMATION

Components not precisely identified are proprietary or non-hazardous. All chemical ingredients appear on the EPA TSCA inventory.

Disclaimer: This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. All recommendations for the use of our products, weather given by us, orally or to be implied from data or lab tests results by us, are based on the current state of our knowledge at the time those recommendations are made. When additional information is obtained, these recommendations may be updated. They may also be influenced by circumstances outside our control. Notwithstanding, such recommendation the user is responsible that the product as supplied by us is suitable to the process or purpose he intends to use it. The user of the product is solely responsible for compliance with all laws and regulations applying to the use of this

product. Since we cannot control the application, use or processing of the product, we do not accept responsibility. Therefore, the user should assure that the intended use of the product will not infringe in any party's intellectual property right.

919.453.5577 • info@tersusenv.com • tersus.com

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End of Safety Data Sheet

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PSA Oxygen Generator

Topaz Series

A Chart Industries Company



Specifically designed for reliability, energy efficiency, and ease-of-use, there are thousands of Topaz PSA Oxygen Generators currently in use throughout the world. The Topaz's ability to deliver up to 95% oxygen concentration make it a great fit for a wide range of commercial applications.

Features

- Self-contained (internal air compressor)
- Heavy duty metal enclosure
- Wall or rack-mount design
- Advanced Engineering
- Ozone resistant/high temperature process tubing
- Quick release fittings for ease of maintenance
- Optional oxygen concentration monitor

Typical Applications

Manufacturing

- Jewelry/Brazing/Soldering
- Thermal/Chemical Oxidation
- Glass Work/Blowing

Environmental

- Ozone (Generator) Feed Gas
- Environmental Remediation
- Waste/Water Treatment

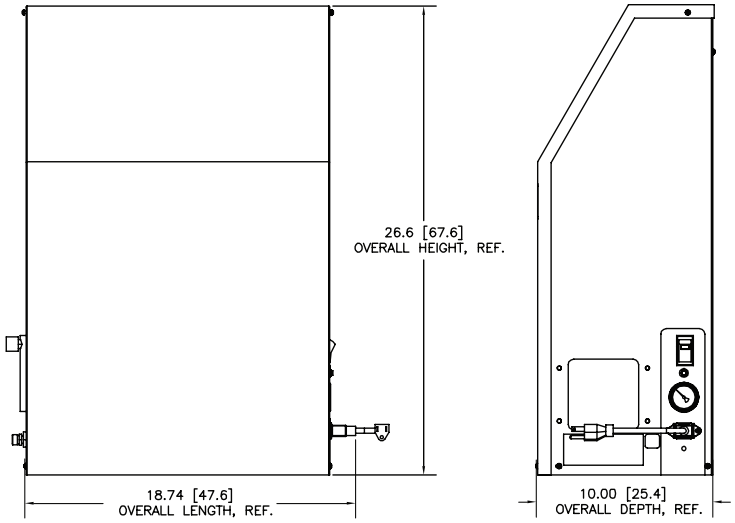
Additional

- Fish Farming

Specifications

	Topaz	Topaz Plus	Topaz Ultra
Product Flow[1]	12 SCFH (0.31 Nm^3/hr or 6 LPM)	17 SCFH (0.44 Nm^3/hr or 8 LPM)	21 SCFH (0.55 Nm^3/hr or 10 LPM)
Product Pressure	9 psig (62 kPa or 0.62 barg)	20 psig (138 kPa or 1.37 barg)	20 psig (138 kPa or 1.37 barg)
Product Concentration	Up to 95%	Up to 95%	Up to 95%
Product Dew Point	-100°F (-73°C)	-100°F (-73°C)	-100°F (-73°C)
Dimensions (W x D x H) (Nominal)	19 x 10 x 27 in (48 x 25 x 68 cm)	19 x 10 x 27 in (48 x 25 x 68 cm)	19 x 10 x 27 in (48 x 25 x 68 cm)
Weight	53 lb (24 kg) [Add 2 lb (0.9 kg) for 220 V ~ unit] [Add 20 lb (9 kg) for Stainless]	56 lb (25 kg) [Add 4 lb (0.9 kg) for 220 V ~ unit] [Add 20 lb (9 kg) for Stainless]	58 lb (26 kg) [Add 4 lb (0.9 kg) for 220 V ~ unit] [Add 20 lb (9 kg) for Stainless]
Physical Connection Product Gas Outlet	¼" NPT-M/B-M size oxygen adapter	¼" NPT-M/B-M size oxygen adapter	¼" NPT-M/B-M size oxygen adapter
Ambient Operating Conditions	Locate the oxygen generator in a well-ventilated area that is protected from weather elements and remains between 40°F (4°C) and 112°F (44°C)		
Control Power Requirements (Single Phase)	100V ~ ±10%, 50 or 60 Hz, 5.5 A 120V ~ ±10%, 60 Hz, 5.0 A 220V ~ ±10%, 50 Hz, 2.5 A	120V ~ ±10%, 60 Hz, 5.0 A 220V ~ ±10%, 50 Hz, 2.5 A	120V ~ ±10%, 60 Hz, 6.0 A 220V ~ ±10%, 50 Hz, 3.0 A
Certifications and Approvals	CAN/CSA C22.2 No. 61010-1, 2nd Ed., UL 61010-1, 2nd Ed., CE		

[1] SCF (Standard cubic foot) gas measured at 1 atmosphere and 70°F / Nm^3 (Normal cubic meter) gas measured at 1 atmosphere and 0°C / LPM (Liters per minute) gas measured at 1 atmosphere and 21°C



Note: All dimensions are nominal.

Ordering Information

Model	Part Number	Description
Topaz	AS013-105	120 V ~ ±10%, 60 Hz, with painted aluminum enclosure
	AS013-106	220 V ~ ±10%, 50 Hz, with painted aluminum enclosure
	AS013-107	220 V ~ ±10%, 60 Hz, with painted aluminum enclosure
	AS013-115	120 V ~ ±10%, 60 Hz, with stainless steel enclosure
	AS013-120	220 V ~ ±10%, 50 Hz, with stainless steel enclosure
	AS013-124	120 V ~ ±10%, 60 Hz, with painted aluminum enclosure & oxygen concentration monitor (LED indicator)
	AS013-125	220 V ~ ±10%, 50 Hz, with painted aluminum enclosure & oxygen concentration monitor (LED indicator)
Topaz Plus	AS018-101	120 V ~ ±10%, 60 Hz, with painted aluminum enclosure
	AS018-102	220 V ~ ±10%, 50 Hz, with painted aluminum enclosure
	AS018-103	220 V ~ ±10%, 50 Hz, with stainless steel enclosure
	AS018-110	220 V ~ ±10%, 60 Hz, with painted aluminum enclosure
	AS018-111	120 V ~ ±10%, 60 Hz, with painted aluminum enclosure & oxygen concentration monitor (LED indicator)
	AS018-115	220 V ~ ±10%, 60 Hz, with stainless steel enclosure
Topaz Ultra	AS123-2	220 V ~ ±10%, 50 Hz, with painted aluminum enclosure
	AS123-3	220 V ~ ±10%, 50 Hz, with stainless steel enclosure
	AS123-7	120 V ~ ±10%, 60 Hz, with painted aluminum enclosure
	AS123-8	120 V ~ ±10%, 60 Hz, with painted aluminum enclosure & oxygen concentration monitor (LED indicator)
	AS123-9	120 V ~ ±10%, 60 Hz, with stainless steel enclosure
	AS123-10	120 V ~ ±10%, 60 Hz, with stainless steel enclosure & oxygen concentration monitor (LED indicator)

Shipping Information	Topaz	Topaz Plus	Topaz Ultra
Class	92.5	92.5	92.5
Commodity Classification Number	8421.39.8040	8421.39.8040	8421.39.8040
Dimensions (W x D x H)	21 x 12 x 29 in (53 x 31 x 74 cm)	21 x 12 x 29 in (53 x 31 x 74 cm)	21 x 12 x 29 in (53 x 31 x 74 cm)
Gross Weight	61 lb (28 kg) [Add 4 lb (1.8 kg) for 220 V ~unit] [Add 20 lb (9 kg) for Stainless]	64 lb (29 kg) [Add 4 lb (1.8 kg) for 220 V ~ unit] [Add 20 lb (9 kg) for Stainless]	66 lb (30 kg) [Add 4 lb (1.8 kg) for 220 V ~ unit] [Add 20 lb (9 kg) for Stainless]

Warranty: 1 Year Parts and Factory Labor*

* An unprotected or inadequately ventilated environment, or improper control power may cause damage to the oxygen generator not covered under warranty.

All performance ratings based on an ambient temperature up to 100°F (38°C), up to 1,000 feet elevation, and 80% relative humidity.

MADE IN USA

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AirSep reserves the right to discontinue its products, or change the prices, materials, equipment, quality, descriptions, specifications and/or processes to its products at any time without prior notice and with no further obligation or consequence. Any rights expressly stated herein are reserved by us, as applicable.

AirSep®
A Chart Industries Company

260 Creekside Drive
Buffalo, NY 14228-2075 U.S.A.
Tel: (716) 691-0202 ■ Fax: (716) 691-1255
www.airsepcpd.com ■ info@airsep.com

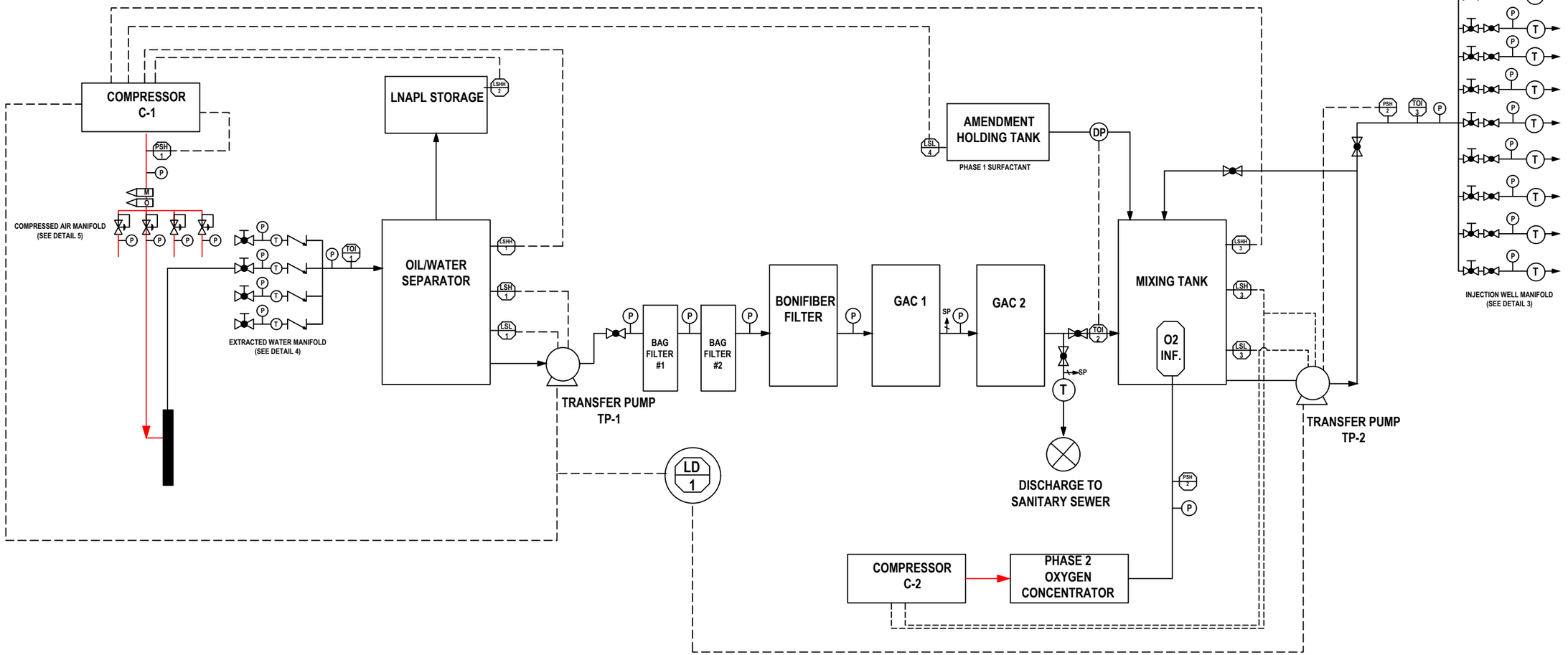
ML-IND0001 C

APPENDIX K
ENGINEERING CONTROL MAINTENANCE LOG

Engineering Control Maintenance Log
34 Berry Street
Brooklyn, NY

Date	Time	Location	Reason for maintenance	Error message	Restart successful?	Description of persistant problem(s)	Modification to system?	Photograph or sketch of problem/modification
MM/DD/YY	HH:MM	Basement	Treatment system shut down.	High Level Alarm	Yes	Oil/Water Separator switch tripped, caused by high fluid levels in OWS. Inspected bag filter housing for potential blockage.	Replaced bag filter in both bag filter housings	NA
MM/DD/YY	HH:MM	Entire site	Annual Site Cap inspection	NA	NA	NA; see Site-Wide Inspection Form	NA	NA

APPENDIX L
GROUNDWATER TREATMENT SYSTEM AS-BUILT DRAWINGS



NOTE:
1. PHASE 2 OXYGEN CONCENTRATOR AND ASSOCIATED EQUIPMENT WILL BE INSTALLED UPON TRANSITION FROM PHASE I TO PHASE II GROUNDWATER TREATMENT (ANTICIPATED FEBRUARY 2022)

LEGEND

- PRESSURE GAUGE
- TOTALIZER
- TRANSFER PUMP
- GLOBE VALVE
- SAMPLE PORT
- BALL VALVE
- CHECK VALVE
- TOTALIZER INDICATOR (DIGITAL OUTPUT)
- HIGH PRESSURE SWITCH
- DOSING PUMP
- LEVEL SWITCH
- PRESSURE REGULATOR
- COMPRESSED AIR LINE
- INTERLOCK/SIGNAL LINE
- LEAK DETECTOR
- MOISTURE/OIL FILTER

STATE OF NEW YORK · REBECCA A. KINAL · 082046-1 · LICENSED PROFESSIONAL ENGINEER

NOT TO SCALE

AKRF
440 Park Avenue South, New York, NY 10016

34 Berry Street
Brooklyn, New York

TREATMENT SYSTEM PROCESS AND INSTRUMENTATION DIAGRAM (P&ID)

DATE
12/13/2021

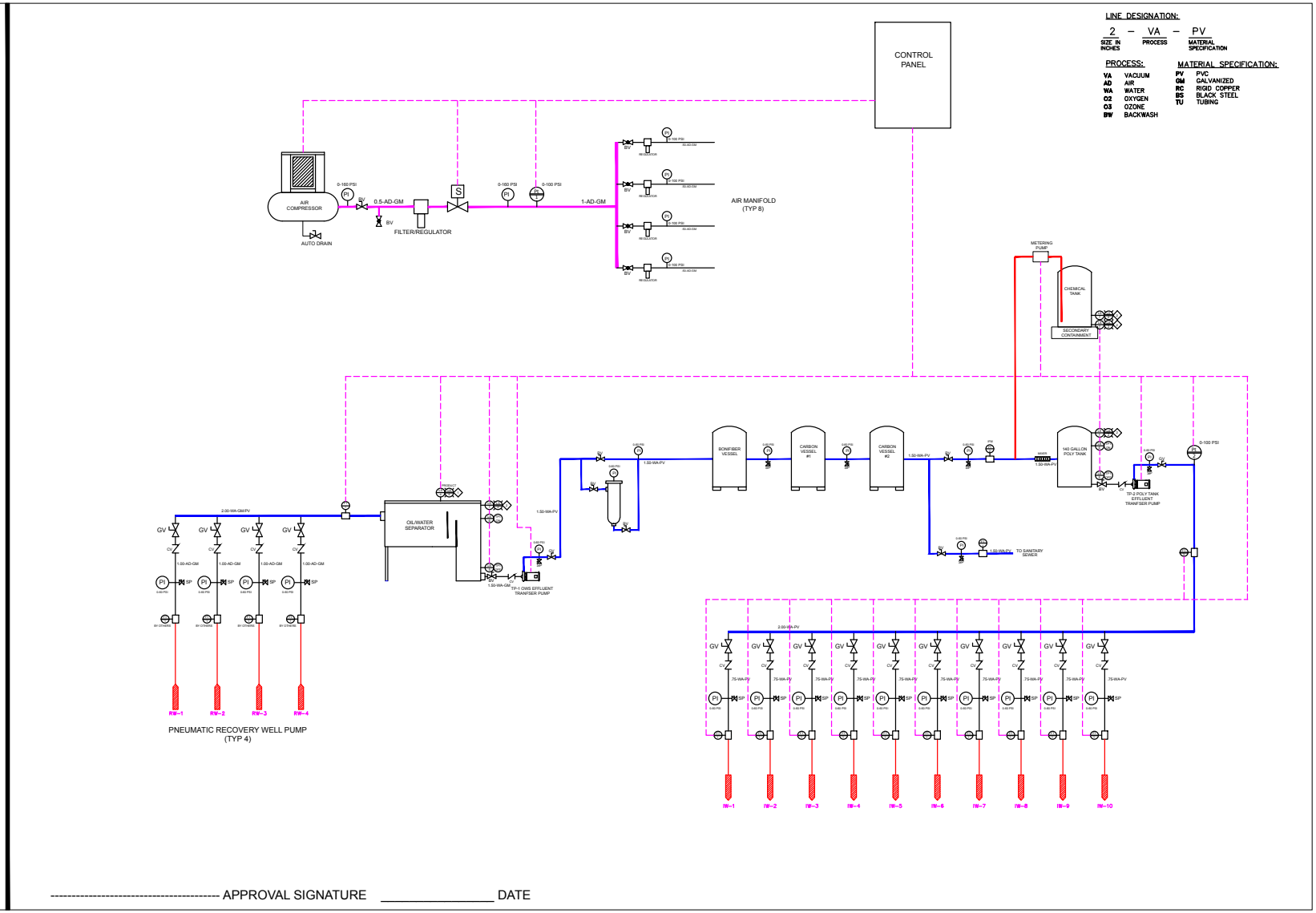
PROJECT NO.
11259

FIGURE
17

©2021 AKRF, Inc M:\AKRF Project Files\11259 - 34 Berry St (LCOR)\BCP\CAD\2021\SMP\11259 Treatment System PID.dwg last save: mveilleux 12/16/2021 4:39 PM

LEGEND

- SOLENOID VALVE
- BUTTERFLY VALVE
- GLOBE VALVE VALVE
- BALL VALVE
- GATE VLAVE
- SWING CHECK VLAVE
- THREADED UNION
- SAMPLE VLAVE
- VALVE NORMALLY OPEN
- VALVE NORMALLY CLOSED
- VACUUM RELIEF VALVE
- PRESSURE RELIEF VALVE
- PARTICULATE FILTER
- PRESSURE INDICATOR
- VACUUM INDICATOR
- TEMPERATURE INDICATOR
- SIGHT TUBE
- LEVEL SWITCH No (x)
- PRESSURE (VACUUM) SWITCH No (x)
- ANALOG PRESSURE TRANSMITTER No (x)
- ANALOG TEMPERATURE TRANSMITTER No (x)
- ANALOG FLOW TRANSMITTER No (x)
- ANALOG VACUUM TRANSMITTER No (x)
- ANALOG LEL TRANSMITTER No (x)
- HIGH LEVEL ALARM No (x)
- LOW FLOW ALARM No (x)
- LOW VACUUM ALARM No (x)
- HIGH VACUUM ALARM No (x)
- HIGH LEL ALARM No (x)
- MOTOR OVERLOAD No (x)
- FATAL ALARM No (x)
- CONTROL PANEL READOUT
- MOTOR

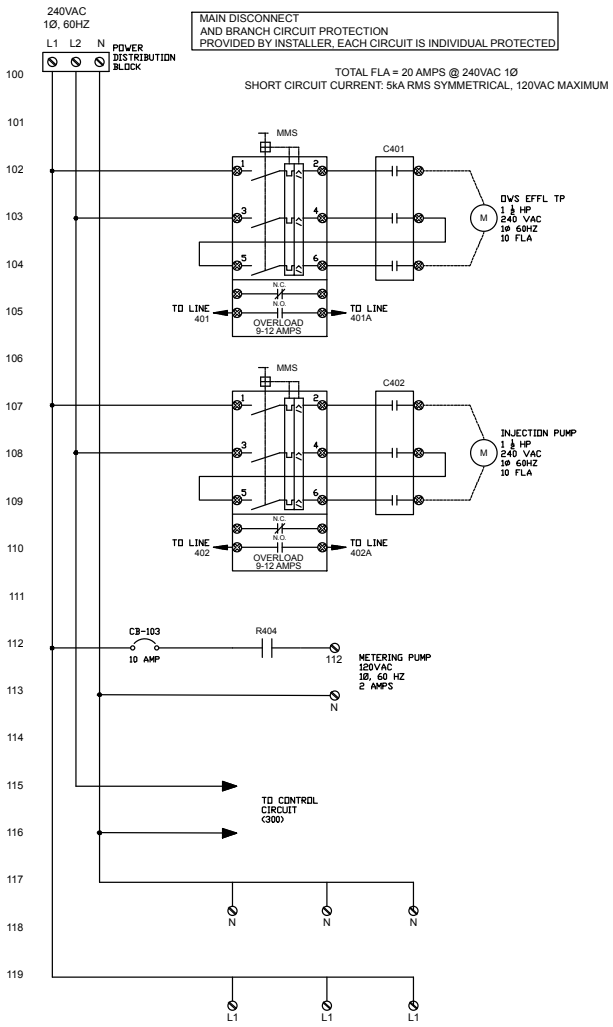


---------- APPROVAL SIGNATURE _____ DATE

SPECIALTY SYSTEMS INTEGRATORS INC.
14150 23rd Ave N; Plymouth, Minnesota 55447 | tel: 763-450-2600 | WWW.2SSI.COM | email: sales@2ssi.com

TITLE:
PROCESS & INSTRUMENTATION DIAGRAM
AKRF
34 BERRY STREET SYSTEM

DWN:	MV
CHKD:	MV
REV.:	1
DATE:	6/10/2021
DRAWING #:	2180-P&ID



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WARNING: IF AN OVERLOAD OR A FAULT CURRENT INTERRUPTION OCCURS, CIRCUITS MUST BE CHECKED TO DETERMINE THE CAUSE OF THE INTERRUPTION. IF A FAULT CONDITION EXISTS, THE CURRENT CARRYING COMPONENTS SHOULD BE EXAMINED AND REPLACED IF DAMAGED, AND THE INTEGRAL CURRENT SENSORS MUST BE REPLACED TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK.

WARNING: TO MAINTAIN OVERCURRENT, SHORT-CIRCUIT AND GROUND-FAULT PROTECTION. THE MANUFACTURER'S INSTRUCTIONS FOR SELECTION OF OVERLOAD AND SHORT CIRCUIT PROTECTION MUST BE FOLLOWED TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK.

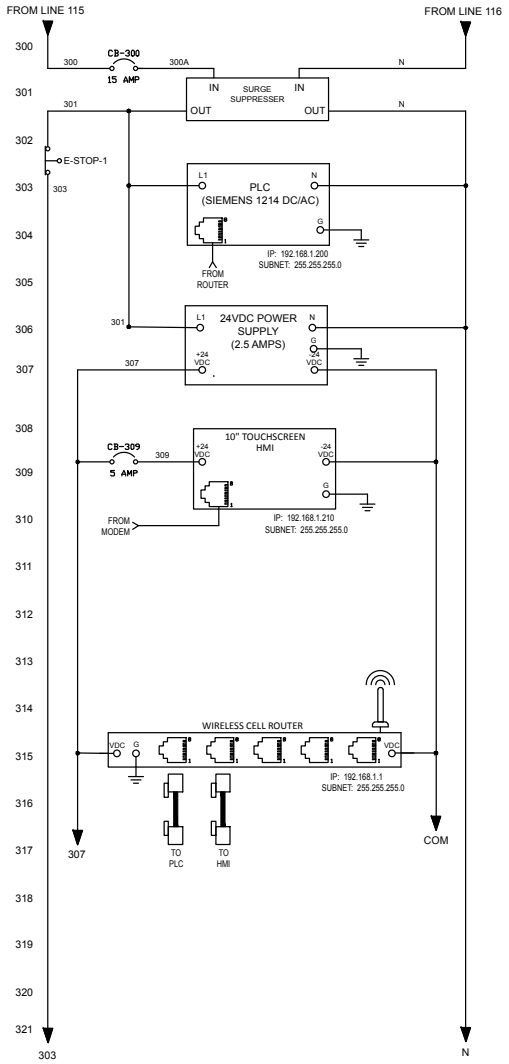
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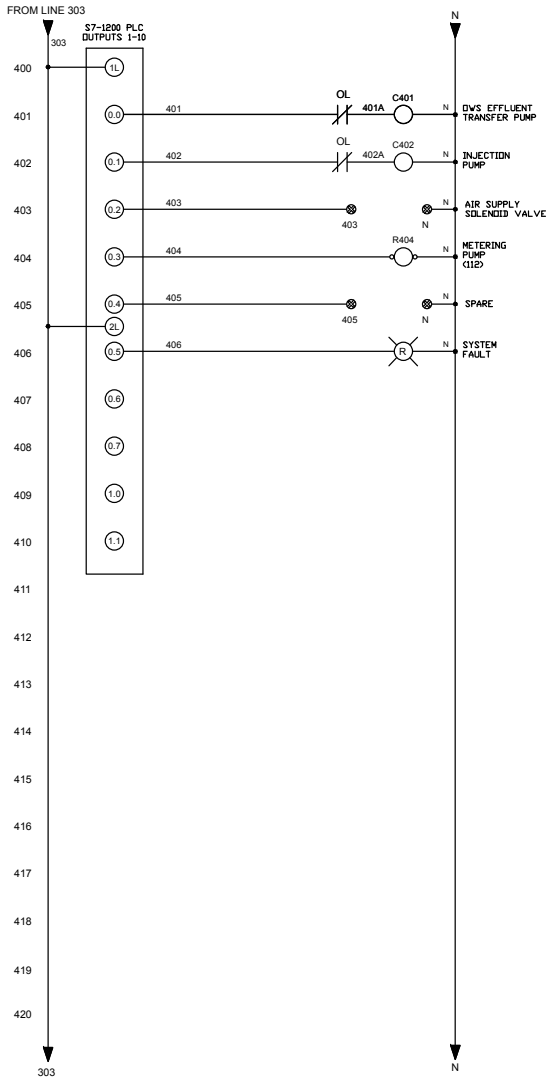
SPECIALTY SYSTEMS INTEGRATORS INC.
14150 23rd Ave N; Plymouth, Minnesota 55447 | tel: 763-450-2600 | WWW.2SSI.COM | email: sales@2ssi.com

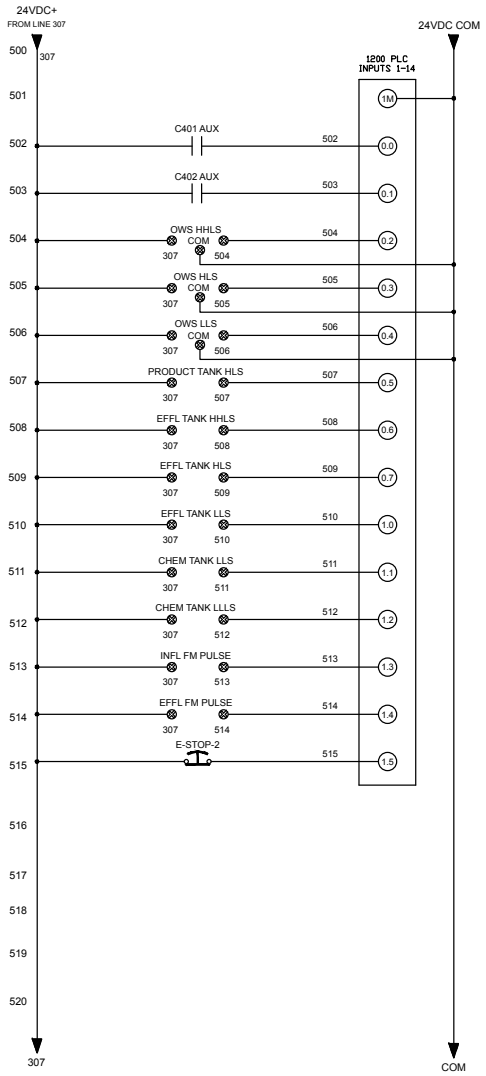
TITLE:
Control Panel Schematics
AKRF
34 BERRY ST GW RECIRC SYSTEM

- POWER DISTRIBUTION BLOCK: TORQUE FIELD WIRING TO 120 IN/LBS
- ALL FIELD WIRING BELOW 100 AMPS SHALL BE COPPER 60° C
  ABOVE 100 AMPS USE 75° C WIRE
  DASHED LINE = FIELD DEVICE

DWN: MV
CHKD: MV
REV.: 0
DATE: 6/2/2021
DRAWING #: 2180-PANEL1







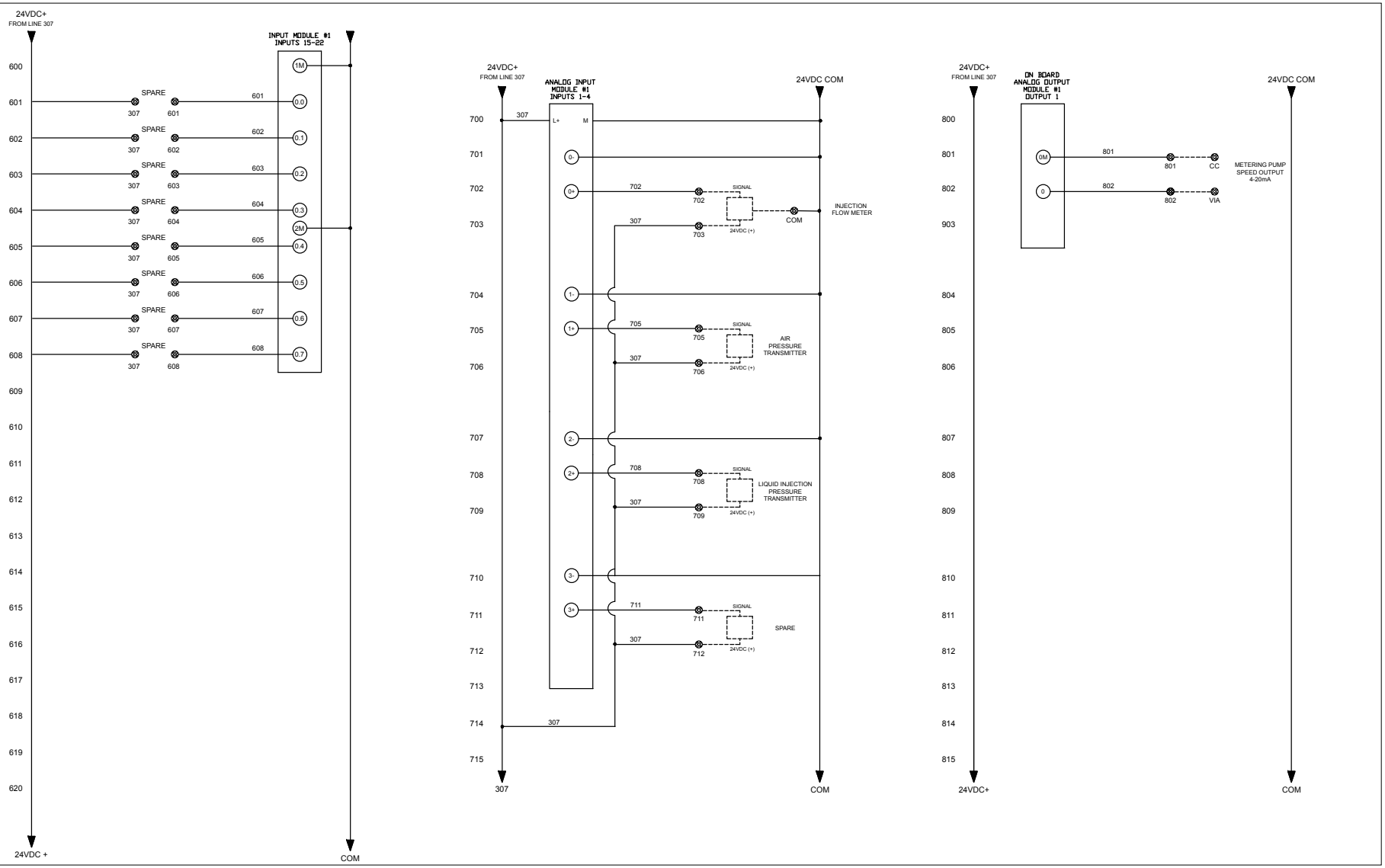
SPECIALTY SYSTEMS INTEGRATORS INC.
14150 23rd Ave N; Plymouth, Minnesota 55447 | tel: 763-450-2600 | WWW.2SSI.COM | email: sales@2ssi.com

TITLE:
Control Panel Schematics
AKRF
34 BERRY ST GW RECIRC SYSTEM

- POWER DISTRIBUTION BLOCK: TORQUE FIELD WIRING TO 120 IN/LBS
- ALL FIELD WIRING BELOW 100 AMPS SHALL BE COPPER 60° C
  ABOVE 100 AMPS USE 75° C WIRE
  DASHED LINE = FIELD DEVICE

DWN: MV
CHKD: MV
REV.: 0

DATE: 6/2/2021
DRAWING #: 2180-PANEL2



SPECIALTY SYSTEMS INTEGRATORS INC.
14150 23rd Ave N; Plymouth, Minnesota 55447 | tel: 763-450-2600 | WWW.2SSI.COM | email: sales@2ssi.com

TITLE:
Control Panel Schematics
AKRF
34 BERRY ST GW RECIRC SYSTEM

- POWER DISTRIBUTION BLOCK: TORQUE FIELD WIRING TO 120 IN/LBS
- ALL FIELD WIRING BELOW 100 AMPS SHALL BE COPPER 60° C
  ABOVE 100 AMPS USE 75° C WIRE
  DASHED LINE = FIELD DEVICE

DWN: MV
CHKD: MV
REV.: 0
DATE: 6/2/2021
DRAWING #: 2180-PANEL3

APPENDIX M
GROUNDWATER TREATMENT SYSTEM INSPECTION LOG

34 Berry Street, Brooklyn, NY
NYSDEC BCP # C224268 / AKRF Project # 11259
Sub-Slab Soil Vapor Points - Quarterly Inspection Log

Time: _____

Date: _____ **Weather:** _____

Personnel: _____ **Objective:** _____

(i.e. Quarterly Visit, Significant Event Inspection, etc.)

Sub-Slab Soil Gas PID Screening (ppm):			**Sub-Slab Soil Gas Vacuum/Pressure Reading (In. H2O):**		
	SG-01	_____		SG-01	_____
	SG-02	_____		SG-02	_____
	SG-03	_____		SG-03	_____
	SG-04	_____		SG-04	_____

Notes/Comments:

34 Berry Street, Brooklyn, NY
NYSDEC BCP # C224268 / AKRF Project # 11259
Groundwater Treatment System - Inspection Log

Time:

Date:

Weather:

Personnel:

Objective:

(i.e. Monthly Visit, Significant Event Inspection, etc.)

Groundwater Extraction

Pressure reading on air compressor:

Air Manifold Pressure (psi)		*Expected Range*
RW-01:		*10-35 psi*
RW-02:		*10-35 psi*
RW-03:		*10-35 psi*
MW-03R:		*10-35 psi*
Total Manifold Pressure		*30-50 psi*

Extracted Fluid Manifold:

Well	Pressure (psi)	Totalizer (gal)
RW-01:		
RW-02:		
RW-03:		
MW-03R:		

Notes/Comments:

Water Treatment (Note that readings can only be collected during OWS Effluent Pump Operation):

Pressure Readings (psi):

Pre-Bag Filter #1:

Post-Bag Filter #1:

Post-Bag Filter #2:

Post Bonifiber Filter:

Post GAC #1:

Product Knockout Tank Level:

Note: Notify PM if depth to product is less than 1 foot in

Volume of product transferred to 55-gallon drum:

Sewer Discharge Totalizer (ft^3):

Date of last air compressor oil change:

Date of last bag filter change:

Notes/Comments: 7.48 gallons = 1 cubic foot (ft^3)

Groundwater Injection

Surfactant Drum Level (if applicable):

Digital Mixing Tank Totalizer (gal):

Plastic Effluent Mixing Tank Level (out of 150 gallons):

Injection Well Manifold:

Well	Pressure (psi)	Totalizer (ft^3)
IW-01		
IW-02		
IW-03		
IW-04		
IW-05		

Well	Pressure (psi)	Totalizer (ft^3)	
IW-06			
IW-07			
IW-08/MW-06			
IW-09/MW-16			
IW-10/MW-01			
Analog Totalizer	N/A		(gallons)

Injection Pump Pressure Gauge (only when injection pump is on):

Amendments added to Effluent Mixing Tank (i.e. electrolyte, nutrients etc.):

Notes/Comments:

34 Berry Street, Brooklyn, NY
NYSDEC BCP # C224268 / AKRF Project # 11259
Groundwater Treatment System - Inspection Log

Time:

Date:

Weather:

Personnel:

Objective:

(i.e. Monthly Visit, Significant Event Inspection, etc.)

Control Panel Status

Pumps

Well ID	On / Off
RW-02	
RW-03	
MW-03R	
MW-03R	

Controls

Control Type	Auto / Off/ Hand
Well Pumps	
OWS Eff Pump	
Chemical Pump	
Injection Pump	

Alarms

Alarm Type	On / Off
Air Pressure at Air Compressor - Low Pressure	
GW Volume in OWS - High Level	
OWS Effluent Pump - Low Flow	
Chemical / Amendment Tank - Low Level	
Chemical / Amendment Tank - Low-Low Level	
Effluent Mixing Tank - Low Level	
Effluent Mixing Tank - High Level	
Effluent Mixing Tank - High-High Level	
Injection Pump - High Pressure	
Product Knockout Tank - High Level	
Oxygen Generator Operation	
Oxygen Pump Operation	

Approx. product level in 55-gallon product storage drum _____ gallons

Photographs taken of system operation/condition? (Y / N)

APPENDIX N
RESPONSIBILITIES OF THE OWNER AND REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan (SMP) for the 34 Berry Street Site (the Site), number C224268, are divided between the site owner(s) and a Remedial Party, as defined below. The owner is currently listed as:

34 Berry Street LLC
850 Cassatt Road, Suite 300
Berwyn, PA 19312

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

34 Berry Street LLC
850 Cassatt Road, Suite 300
Berwyn, PA 19312

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the Site.

Site Owner's Responsibilities:

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

2) In accordance with a periodic time frame determined by NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in an Environmental Easement remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP to include the certification in the Site's Periodic Review Report (PRR) certification to NYSDEC.

3) In the event the Site is delisted, the owner remains bound by the Environmental Easement and shall submit, upon request by NYSDEC, a written certification that the Environmental Easement is still in place and has been complied with.

4) The owner shall grant access to the Site to the RP and NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the owner shall notify the Site's RP and NYSDEC in accordance with the timeframes indicated in Section 1.4 of the SMP - Notifications.

6) In the event some action or inaction by the owner adversely impacts the Site, the owner must notify the Site's RP and NYSDEC in accordance with the timeframes indicated in Section 1.4 of the SMP - Notifications.

7) The owner must notify the RP and NYSDEC of any change in ownership of the Site property (identifying the tax map numbers in any correspondence) and provide contact information for the new owner of the Site property. 6 NYCRR Part 375 contains notification requirements applicable to any construction or activity changes and changes in ownership. Among the notification requirements is the following: 60 days prior written notification must be made to NYSDEC. Notification is to be submitted to the NYSDEC Division of Environmental Remediation's Site Control Section. Notification requirements for a change in use are detailed in Section 1.4 of the SMP. A 60-Day Advance Notification Form and Instructions are found at http://www.dec.ny.gov/chemical/76250.html.

8) In accordance with the tenant notification law, within 15 days of receipt, the owner must supply a copy of any vapor intrusion data that is produced with respect to structures and that exceeds the New York State Department of Health (NYSDOH) or United States Occupational Safety and Health Administration (OSHA) guidelines on the Site, whether produced by NYSDEC, the RP, or owner, to the tenants on the property. The owner must otherwise comply with the tenant and occupant notification provisions of Environmental Conservation Law Article 27, Title 24.

Remedial Party Responsibilities

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

2) The RP shall report to NYSDEC all activities required for remediation, operation, maintenance, monitoring, and reporting. Such reporting includes, but is not limited to, periodic review reports and certifications, electronic data deliverables, corrective action work plans and reports, and updated SMPs.

3) Before accessing the Site property to undertake a specific activity, the RP shall provide the owner with advanced notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the Site visit and/or any final report produced.

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

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

6) The RP shall notify NYSDEC of any damage to or modification of the systems as required under Section 1.4 of the SMP.

7) Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to NYSDEC for approval an amended SMP.

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

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

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

APPENDIX N
RESPONSIBILITIES OF THE OWNER AND REMEDIAL PARTY

Responsibilities

The responsibilities for implementing the Site Management Plan (SMP) for the 34 Berry Street Site (the Site), number C224268, are divided between the site owner(s) and a Remedial Party, as defined below. The owner is currently listed as:

34 Berry Street LLC
850 Cassatt Road, Suite 300
Berwyn, PA 19312

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Berwyn, PA 19312

Nothing on this page shall supersede the provisions of an Environmental Easement, Consent Order, Consent Decree, agreement, or other legally binding document that affects rights and obligations relating to the Site.

Site Owner's Responsibilities:

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

2) In accordance with a periodic time frame determined by NYSDEC, the owner shall periodically certify, in writing, that all Institutional Controls set forth in an Environmental Easement remain in place and continue to be complied with. The owner shall provide a written certification to the RP, upon the RP's request, in order to allow the RP to include the certification in the Site's Periodic Review Report (PRR) certification to NYSDEC.

3) In the event the Site is delisted, the owner remains bound by the Environmental Easement and shall submit, upon request by NYSDEC, a written certification that the Environmental Easement is still in place and has been complied with.

4) The owner shall grant access to the Site to the RP and NYSDEC and its agents for the purposes of performing activities required under the SMP and assuring compliance with the SMP.

5) The owner is responsible for assuring the security of the remedial components located on its property to the best of its ability. In the event that damage to the remedial components or vandalism is evident, the owner shall notify the Site's RP and NYSDEC in accordance with the timeframes indicated in Section 1.4 of the SMP - Notifications.

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3) Before accessing the Site property to undertake a specific activity, the RP shall provide the owner with advanced notification that shall include an explanation of the work expected to be completed. The RP shall provide to (i) the owner, upon the owner's request, (ii) NYSDEC, and (iii) other entities, if required by the SMP, a copy of any data generated during the Site visit and/or any final report produced.

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

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

6) The RP shall notify NYSDEC of any damage to or modification of the systems as required under Section 1.4 of the SMP.

7) Prior to a change in use that impacts the remedial system or requirements and/or responsibilities for implementing the SMP, the RP shall submit to NYSDEC for approval an amended SMP.

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