DNAPL RECOVERY LETTER REPORT

WORK ASSIGNMENT D007622-30.1

FORMER SPIC AND SPAN CLEANERS
& DYERS, INC. SITE
GREENPOINT/EAST WILLIAMSBURG
INDUSTRIAL AREA

SITE NO. 224129
KINGS (C), NY

Prepared for:
NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 Broadway, Albany, New York

Basil Seggos, Commissioner
DIVISION OF ENVIRONMENTAL REMEDIATION

URS Corporation
257 West Genesee Street
Suite 400
Buffalo, New York 14202

February 2017
February 6, 2017

Mr. David K. Harrington, P.E.
Senior Environmental Engineer
Remedial Bureau B
Division of Environmental Remediation
NYS Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, New York 12233-7016

Re:  NYSDEC Standby Contract, Work Assignment No. D007622-30.1
Former Spic and Span Cleaners & Dyers, Inc., Site ID No. 224129
DNAPL Recovery Letter Report

Dear Mr. Harrington:

URS Corporation - New York (URS) has prepared this dense non-aqueous phase liquid (DNAPL) Recovery Letter Report to update the status of DNAPL removal activities completed between February 2016 and January 2017. This report also summarizes the November 2016 field activities and soil analytical results associated with installation of four additional DNAPL extraction wells (EW-03 through EW-06) at the 315 Kingsland Avenue property (i.e., Former Spic and Span Cleaners & Dyers, Inc. Site [New York State Department of Environmental Conservation {NYSDEC} Site Number 224129]) in the Greenpoint/East Williamsburg Industrial Area section of Brooklyn, New York (Figure 1). DNAPL removal was performed at wells DEC-024, DEC-024D, DEC-024DR, DEC-092D, DEC-136, DEC-136D, EW-01, EW-02, EW-03, EW-04, EW-05 and EW-06 (Figure 2). Table 1 summarizes DNAPL removal periods and quantities of DNAPL removed from each well. The work was completed under NYSDEC Work Assignment No. D007622-30.1.

1.0 ADDITIONAL EXTRACTION WELL INSTALLATION

Activities associated with the 315 Kingsland Avenue November 2016 extraction well installation consisted of:

- Utility clearance by a geophysical contractor (i.e., Radar Solutions International – RSI) along the sidewalk area between 315-307 Kingsland Avenue;
- Advancement of 4 soil borings by Glacier Drilling Co. using rotosonic drilling methods up to approximately 27 feet below ground surface (bgs). All boring locations were cleared to 5 feet bgs by hand clearing/Vac-Tron® prior to direct push probing. Table 2 summarizes the rationale for each extraction well location;
- Collection of up to 3 soil samples for analytical testing via Method 8260B from each soil boring location and Quality Assurance/Quality Control (QA/QC) samples;
- Converting each of the 4 soil borings into permanent extraction wells;
- DNAPL and groundwater removal from DEC-024, DEC-024D, DEC-024DR, DEC-092D, DEC-136, DEC-136D, EW-01, EW-02, EW-03, EW-04, EW-05 and EW-06; and
- Removal of all investigation derived waste (IDW) by Island Pump & Tank Corp. (e.g., soil cuttings, decontamination water, and DNAPL) from the site on a daily basis; and
• Survey of the four new extraction well locations by MJ Engineering. The survey was tied into the existing site survey.

1.1 **Extraction Well Installation Field Activities**

Field activities associated with extraction well installations were conducted between November 7 and 11, 2016. Site photographs are provided in Appendix A and copies of the daily field notes are provided in Appendix B.

1.1.1 **Utility Clearance**

Prior to site work, the drilling subcontractor arranged for all appropriate utility clearance mark-outs and New York City Department of Transportation (NYC DOT) Permits. This included (but was not limited to) contacting the New York City (NYC) Departments of Environmental Protection and Transportation (NYCDEP and NYCDOT), the Transit Authority, Consolidated Edison Company of New York (Con Edison), National Grid, and Verizon, in addition to using the Dig Safe number for New York City (New York 811) 811 or (800) 272-4480.

1.1.2 **Geophysical Survey for Utility Markouts**

On November 7, 2016, Radar Solutions International of Waltham, MA (RSI) mobilized a one person crew with ground penetrating radar (GPR) and electromagnetic (EM) induction equipment to the Site. The purpose of the geophysical survey was to screen for, and identify the presence/location of, underground utilities in areas where the soil borings and extraction wells were proposed.

A geophysical survey reference grid was established on the sidewalk adjacent to the Site building located between 307-315 Kingsland Avenue. A GSSI SIR-3000 digital radar system was used to perform the GPR survey. GPR data were acquired along lines spaced 2.5 feet apart across a reference grid of approximately 200 feet x 15 feet. The EM induction equipment used to determine the location of buried utilities and trace utilities was a Radiodetection RD8000 locating system and a McLaughlin’s Verifier GX digital locator. RSI marked utilities and anomalies by spray-painting the outline on the pavement as soon as they were located. A URS geologist supervised and assisted RSI. A copy of RSI’s report is provided in Appendix C.

1.1.3 **Soil Borings and Extraction Well Installation**

Between November 7 and 11, 2016, URS provided oversight for the advancement of four soil borings and the installation of extraction wells in each of the four soil borings (Figure 2). The extraction wells were installed along the sidewalk area adjacent to 307-315 Kingsland Avenue.

1.1.4 **Pre-Boring Clearing**

Prior to any intrusive activities, the subcontractor obtained all necessary permits (i.e., NYC DOT street opening permits) for conducting intrusive activities. On November 7, 2016, Glacier Drilling, LLC of Durham, CT (Glacier) mobilized one Vac-Tron® unit each to perform location-specific utility clearance at each of the proposed extraction well locations. At each
location, a 1.5-foot by 1.5-foot square area of the concrete was cut. An approximately 1.5-foot diameter by five-foot deep hole was excavated using post-hole diggers, pry bars, and an air knife along with the Vac-Tron® unit. A total of four boring locations were cleared on November 7, 2016. A URS geologist screened the soils being removed with a PID and classified the soils. After the location was cleared for drilling, the hole was backfilled flush with the concrete surface using the excavated spoils (rocks and debris removed) and, temporarily patched with blacktop patch or concrete.

1.1.5 Soil Borings

Between November 9 and 11, 2016, Glacier utilized a track-mounted Geoprobe® 8140 LS Roto Sonic drilling rig to advance the soil borings that were completed as extraction wells.

The well borings were advanced using a 4-inch inside diameter (ID) inner sampler and a 6-inch ID outer casing. Soil samples were collected continuously from the ground surface to the terminus of each boring. The procedure for the advancement of the borehole was to advance the inner sampler to the appropriate interval (5 or 10 feet) and then advance the outer casing over the inner sampler to the desired depth. After the outer casing was advanced, the inner sampler was retrieved and the sample core collected was placed in a polyethylene sample tube. The process was repeated until the desired depth was reached. The extraction well borings were advanced to depths 27 feet bgs.

Soil samples were screened with a PID. Up to three soil samples were collected from each boring; the soil samples were generally collected from the intervals exhibiting odors, staining, or elevated PID reading(s). If no odors, staining, or elevated PID readings were encountered, then only one sample from the interval just above the water table was collected. Soil boring logs are provided in Appendix D.

For the soil samples collected from extraction well/soil borings, a COC form was maintained and accompanied the soil sample containers to Pace Analytical Service of Melville, NY (Pace), a NYSDOH ELAP accredited laboratory. The soil samples were analyzed for target compound list (TCL) VOCs plus tentatively identified compounds (TICs), following USEPA SW846 Method 8260B.

All IDW generated from the monitoring well installation was containerized in Department of Transportation (DOT) approved 55-gallon drums and picked up by Island Pump & Tank Corp. of East Northport, NY (IP&T), on a daily basis for off-site disposal at a permitted facility.

1.1.6 Extraction Well Construction

Extraction wells EW-03, EW-04, EW-05, and EW-06 were constructed using continuous wrap stainless steel screens in the event DNAPL was present in the monitoring wells. PVC integrity degrades when in direct contact with concentrated chlorinated solvents. Each extraction well was constructed with 15 feet of 2-inch ID, Type 304 stainless steel 0.010-inch continuous wire wrap screen and a 2-foot long stainless steel sump. The screen was nominally set between 10 feet and 25 feet below ground surface and the 2-foot stainless-steel sump extended from the bottom of the well screen to 27 feet bgs. Bentonite was placed around the sump and a #1 size
sand pack was installed from the bottom of the well up to 2 feet above the top of the well screen. Schedule 40 PVC riser was attached to the well screen up to the ground surface. Bentonite chips were then installed around the riser to an elevation of approximately 3-feet bgs.

Each extraction well was finished with a locking well cap, a concrete apron, and a flush-mounted curb box. Security bolts were installed in the well covers to minimize the potential for unauthorized well access. The concrete apron for each well pad was approximately 6 inches thick. Extraction well construction logs are provided in Appendix F.

1.1.7 **Extraction Well Development**

At least 24 hours after the monitoring wells were installed, URS personnel developed the wells with the pump and surge development method using a Waterra Inertial Hydrolift pump with dedicated/disposable high density polyethylene (HDPE) tubing and dedicated/disposable HDPE check valves. Prior to well development, a 100-foot long Solinst oil/water interface probe was used to check for the presence/thickness of any free product. Each extraction well was purged to dryness multiple times during the development and water clarity and detailed observations on its appearance, including presence/absence of DNAPL was recorded. Well development logs may be found in Appendix G. Well development water was collected in DOT approved 55-gallon drums and picked up daily by IPT for off-site disposal at a permitted facility.

1.1.8 **Investigation Derived Waste Disposal**

IP&T was contracted for the daily pick-up and disposal of all drummed IDW at a permitted disposal facility. Copies of the hazardous waste manifests are provided in Appendix H.

1.1.9 **Site Survey**

MJ Engineering, a URS subcontractor, surveyed additional extraction well locations in December 2016. The survey was tied into the existing site survey for the greater Meeker Plume Trackdown area. All surveying was performed under the supervision of a New York State licensed land surveyor. All vertical control points were referenced to the North American Vertical Datum 1988 (NAVD 1988). Horizontal datum was referenced to the North American Datum of 1983 (NAD 83), New York State Plane Coordinate System, Long Island Zone.
2.0 DISCUSSION OF SUBSURFACE RESULTS

The overburden stratigraphy was sampled and characterized as extraction well borings were advanced. Soil samples were collected for off-site laboratory analysis. The subsections summarize the findings.

2.1 Site Geology

As shown in the boring logs (Appendix D), a fill unit is present at all borings, varying in thickness from approximately 1 to 1.5 feet, and consists of concrete over a heterogeneous mixture of soil and asphalt. Beneath the fill, the shallow overburden consists primarily of a silt and sand, mixed with some gravel and cobbles. The layers of gravel and cobbles are thickest in the northern most borings (EW-03 and EW-05). The water table surface in these borings is approximately 18.5 feet bgs.

The inclusive sand layer was identified at depths between 17 and 21 feet bgs and exhibited high PID readings and high PCE concentrations. This inclusive sand layer was identified within the glacial till unit at borings EW-03 through EW-06, in the vicinity of SSB-11 and SSB-28 through SSB-32, which are located adjacent to the Spic and Span Site. This is generally consistent with data from previous investigations.

2.2 Soil Analytical Results

Seven soil samples were collected from 4 locations and analyzed for VOCs during the period November 10 and 11, 2016. At several locations, more than one sample was obtained from multiple depths. The samples were analyzed for TCL VOCs. The soil sample results were compared to appropriate Part 375 criteria.

Full deliverable data packages [i.e., equivalent to NYSDEC Analytical Service Protocol (ASP) Category B] were provided by the laboratory and included all reporting forms and raw data necessary to fully evaluate and verify the reported analytical results.

A Data Usability Summary Report (DUSR) was prepared following the guidelines provided NYSDEC Division of Environmental Remediation DER-10 Technical Guidance for Site Investigation and Remediation, Appendix 2B - Guidance for Data Deliverables and the Development of Data Usability Summary Reports, May 2010. The data packages were reviewed for compliance with analytical method requirements and the applicable USEPA Region II QA Standard Operating Procedures. The type and quality of analytical results that are needed to answer specific environmental questions and support proper environmental decisions met the project quality objectives (PQOs) for this sampling event.

The complete validated analytical results from the soil, groundwater, and soil vapor samples are presented in the DUSR in Appendix E, on a compact disk (CD). Data summary tables, Form I and Form Ie (TICs) are provided in the DUSR and include the reporting limit for each non-detected compound.
A summary of the detected TCL VOC analytical results for soil samples as compared to unrestricted use, protection of groundwater, and site background SCGs is presented in Table 3. Table 4 lists the detected TCL VOC analytical results for soil samples as compared to residential and restricted residential SCGs. Soil data exceeding criteria is presented on Figure 3 for Unrestricted Use, Protection of Groundwater, Residential Use, Restricted Residential Use and Site Background.

PCE concentrations ranged from 5.5 mg/kg at EW-05 (20-21 feet bgs) to 39,000 mg/kg at EW-04 (18-18.5 feet bgs). PCE exceeded unrestricted use and protection of groundwater criteria in EW-03, EW-04, EW-05, and EW-06 at every sample depth interval collected. PCE concentrations also exceeded Residential Use and Restricted Residential Use criteria at all locations and depths, except for EW-05 (20-21 feet bgs).

TCE also exceeded its respective unrestricted use and protection of groundwater criteria in EW-05 at 7.9 mg/kg (20-21 feet bgs).

Other petroleum-related and VOC compounds were detected, with isopropylbenzene being the only other compound detected at a concentration exceeding its unrestricted use and protection of groundwater criteria at EW-05 (4.5 mg/kg [20-21 feet bgs]).

3.0 DNAPL RECOVERY FIELD ACTIVITIES

DNAPL was removed from the extraction wells (EW-01 through EW-06), and monitoring wells DEC-136, DEC-136D, DEC-092D, DEC-024, DEC-024D, and DEC-024DR using a Waterra Inertial Hydrolift pump with dedicated/disposable HDPE tubing and check valves and dedicated/disposable, 36 inch long 1-liter HDPE bailers. In total, 279 gallons (3,491 lbs.) of DNAPL was removed at the site through January 19, 2017 (Table 5). As summarized in Table 5, the quantity of DNAPL removed from wells, was in some instances estimated, based upon a combination of the visual appearance (e.g., appearance of an emulsion) and PID readings. The majority of DNAPL was removed from one well, DEC-136. Table 5 and Appendix I provide DNAPL product recovery summaries for each well.

3.1 Well Surging

Well surging, and subsequent DNAPL recovery, took place at wells DEC-024, DEC-024D, DEC-024DR, DEC-092D, DEC-136, DEC-136D, EW-01 and EW-02. Surging was performed using a Waterra Inertial Hydrolift pump with dedicated/disposable HDPE tubing and check valves to induce a hydraulic gradient to the wells and promote DNAPL accumulation. The purge water removed from all wells had visible sheens, with occasional blebs of product and/or emulsions, and also exhibited concentrated levels of dissolved phase chlorinated volatile organic compounds (CVOCs) as evidenced by high photoionization detector (PID) readings. Total groundwater purge volumes were: 51 gallons was removed from DEC-024 over a single day; 50 gallons was removed from DEC-024D on a single day; 50 gallons was removed from DEC-024DR on a single day; 55 gallons was removed from DEC-092D over a single day; 40 gallons was removed from DEC-136 over three days, 20 gallons was removed from DEC-136D over a single day; 55 gallons was removed from EW-01 over a single day and 55 gallons was removed from EW-02 on a single day. Details on the well redevelopment can be found in Appendix G.
3.2 Air Monitoring

Throughout DNAPL removal activities, air monitoring was performed using a combination of PID readings, and substance-specific monitoring using a Dräger Chip Measurement System (CMS). CMS chips employed included Vinyl Chloride, Tetrachloroethene, Trichloroethene, and Benzene. At no point during DNAPL removal did concentrations of these four substances exceed Occupational Health Safety Administration (OSHA) permissible exposure limits (PELs) or short-term exposure limits (STELs). Additionally, breathing zone and downwind PID measurements were within community air monitoring requirements at all times per the Health and Safety Plan.

4.0 RECOMMENDATIONS

DNAPL monitoring and removal activities (if DNAPL is present) should continue at monthly intervals beginning in February 2017. Monthly DNAPL recovery status reports should be prepared and submitted to the Department within 2 weeks of each monthly DNAPL recovery event.
Closing

We appreciate working with the Department on this challenging project. Please contact me at 716-856-5636 if you have any questions or comments.

Sincerely,

URS Corporation

[Signature]

Michael Gutmann
Project Manager

cc: File: 60429463 (R-1)
George Kisluk URS

Enc. Figure 1 – Site Location
   Figure 2 – Monitoring Well and Soil Boring Locations
   Figure 3 – Soil Analytical Results Exceeding Criteria

   Table 1 – Daily Summary of DNAPL Recovery at Well Location
   Table 2 – On-Site Extraction Well Location Rationale
   Table 3 – Summary of Detected VOCs in Soil Samples (Unrestricted Use, Protection of Groundwater and Background Criteria)
   Table 4 - Summary of Detected VOCs in Soil Samples (Residential and Restricted Residential Criteria)
   Table 5 – Combined Summary of DNAPL Observations/DNAPL Recovery

Appendix A - Photographic Log
Appendix B - Field Notes
Appendix C - Geophysical Report
Appendix D - Soil Boring Logs
Appendix E - Data Usability Summary Report
Appendix F - Extraction Well Construction Logs
Appendix G – Well Development Logs
Appendix H - Waste Disposal Documents
Appendix I - DNAPL Recovery Summaries Per Well