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To: Richard P. Mustico, NYSDEC

From: Paul McMahan

Info: J. Grathwol (NYSDEC), M. Burke, M. Ambrusch, A. Quinn and V. De Paula (Langan)

Date: 16 September 2020

Re: Air Sparge and Soil Vapor Extraction System Pilot Test Work Plan
473 President Street
Brooklyn, NY
NYSDEC BCP Site No.: C224220
Langan Project No.: 170361303

This memorandum discusses the implementation of a pilot test to support the design of a full-scale air sparge and soil vapor extraction (AS/SVE) system. The pilot test is a component of the draft Remedial Action Work Plans (RAWP), prepared by Langan and submitted to the New York State Department of Environmental Conservation (NYSDEC) for review for 473 President Street (C224220) and 469 President Street/532 Union Street (C224309). The scope described herein is anticipated to be completed in the fall of 2020. Well installation methodology and sampling procedures described herein will be completed in accordance with the NYSDEC-approved 23 November 2015 Remedial Investigation Work Plan (RIWP), prepared by Langan.

Well and Monitoring Point Installation

Two permanent 2-inch groundwater monitoring well couplets (four total wells) will be installed with 5-foot-long screens set at deeper intervals than those of the wells currently existing on-site. One couplet will be installed with screened intervals at 25 to 30 and 35 to 40 feet below grade surface (bgs). The other couplet will be installed with screened intervals at 30 to 35 and 35 to 40 feet bgs. Borings for the new groundwater wells will be terminated at a shallower depth if an impermeable layer (i.e., clay) is encountered and the well screens will be adjusted accordingly. Two wells, selected from either the newly installed wells or the existing wells, will be used as pilot test air sparge wells. Six temporary 4-inch wells screened within the vadose zone will be installed and used as pilot test SVE wells. All wells will be constructed of schedule 40 polyvinyl chloride (SCH40 PVC). In addition, up to 10 temporary sub-slab monitoring points will be installed to monitor sub-slab vacuum propagation. The proposed locations of these wells and sub-slab monitoring points are shown on Figure 1.

Proposed groundwater monitoring wells will be installed using a track-mounted direct-push Geoprobe® drilling rig and proposed SVE wells will be installed using hollow stem augers. Proposed sub-slab monitoring points will be installed using a hammer drill. Excess soil cuttings

will be containerized in sealed and labeled 55-gallon steel drums and securely staged on-site in preparation for off-site disposal.

A Community Air Monitoring Program (CAMP) will be implemented during any of the ground-intrusive activities (i.e., drilling). The CAMP will include continuous real-time monitoring for volatile organic vapors (using a photoionization detector [PID]) and 10 micrometer (μm) particulate concentrations (using a DustTrak aerosol monitor) at one work-zone perimeter CAMP station.

Groundwater Sampling and Pilot Test

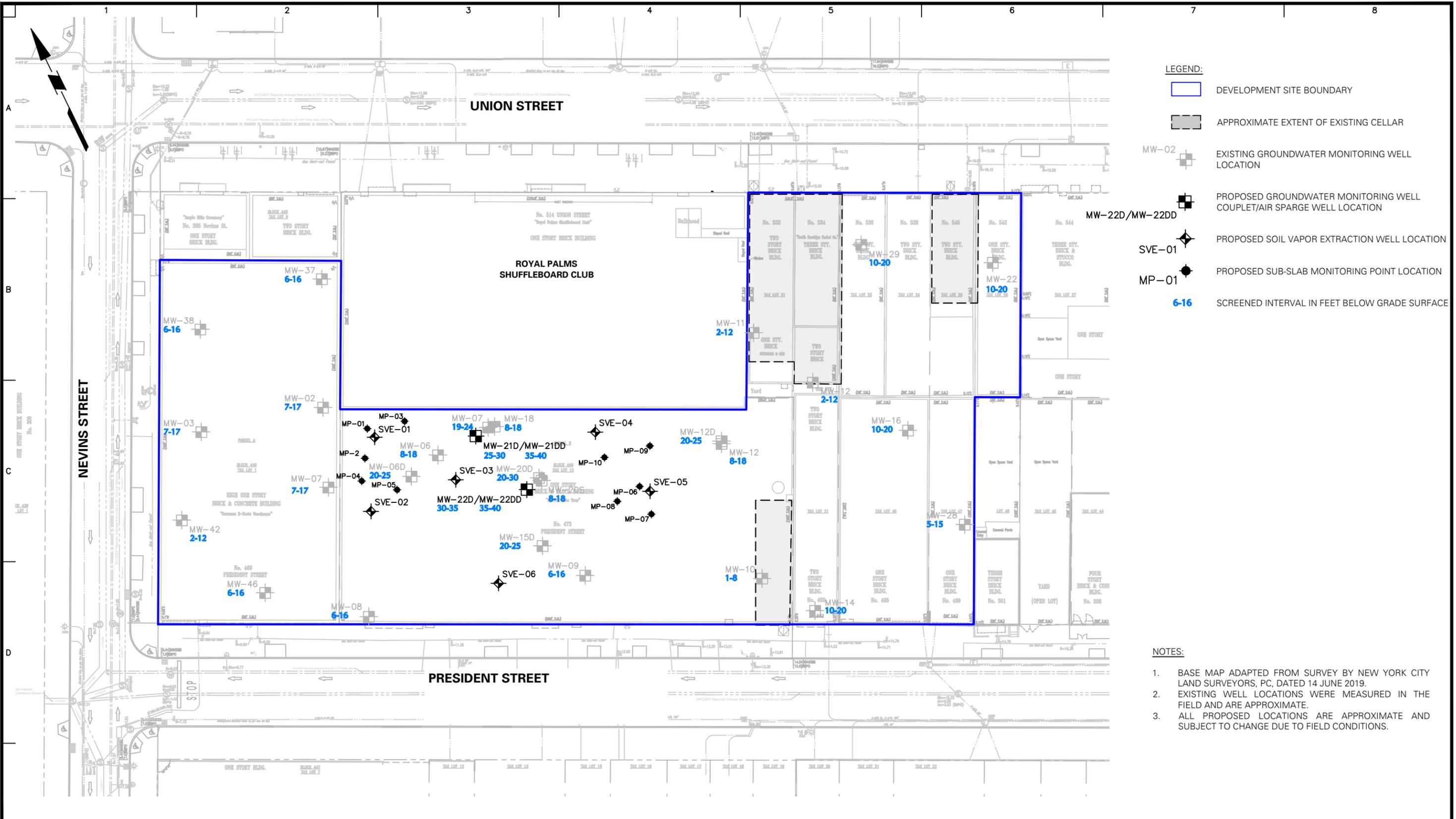
Each of the newly installed groundwater monitoring wells will be developed and sampled. One groundwater sample will be collected from each newly installed monitoring well and analyzed for NYSDEC Part 375/Target Compound List (TCL) volatile organic compounds (VOCs) for vertical delineation.

The air sparge pilot testing will be completed separately at each of the two air sparge wells. A series of step tests will be completed, in which variable air injection flow rates and pressures (low to high) will be applied to each of the air sparge wells. An air compressor will be used to conduct the testing at each air sparge well. Each respective SVE well will be operated with a blower during air sparge pilot testing. Similarly, during the point permeability testing, variable air extraction flow rates and vacuums (low to high) will be applied at one of the SVE wells in each test area. A blower will be used to conduct the testing at each SVE well. During the different tests, the resultant system influence (i.e., pressure or vacuum) will be monitored at nearby existing monitoring wells, SVE wells and the sub-slab monitoring points, as appropriate. In addition to pressure or vacuum, total VOCs will also be monitored at each of the monitoring wells, SVE wells, and sub-slab monitoring points via a handheld PID.

Reporting

The results of the pilot test, subsequent analysis, pneumatic modeling, and full-scale system concept-level design will be summarized in a forthcoming Remedial Design Document. The following items will be included in the Remedial Design Document:

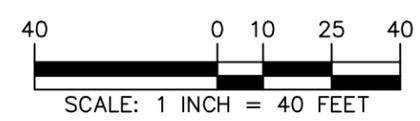
- Evaluation of groundwater treatment alternatives
- Groundwater sample procedures, results, and analysis
- Pilot test procedures, results, and analysis
- Subsurface pneumatic computer modeling results
- Full-scale AS/SVE system concept design



- LEGEND:**
- DEVELOPMENT SITE BOUNDARY
 - APPROXIMATE EXTENT OF EXISTING CELLAR
 - MW-02 EXISTING GROUNDWATER MONITORING WELL LOCATION
 - PROPOSED GROUNDWATER MONITORING WELL COUPLER/AIR SPARGE WELL LOCATION
 - SVE-01 PROPOSED SOIL VAPOR EXTRACTION WELL LOCATION
 - MP-01 PROPOSED SUB-SLAB MONITORING POINT LOCATION
 - 6-16 SCREENED INTERVAL IN FEET BELOW GRADE SURFACE

- NOTES:**
1. BASE MAP ADAPTED FROM SURVEY BY NEW YORK CITY LAND SURVEYORS, PC, DATED 14 JUNE 2019.
 2. EXISTING WELL LOCATIONS WERE MEASURED IN THE FIELD AND ARE APPROXIMATE.
 3. ALL PROPOSED LOCATIONS ARE APPROXIMATE AND SUBJECT TO CHANGE DUE TO FIELD CONDITIONS.

WARNING: IT IS A VIOLATION OF THE NYS EDUCATION LAW ARTICLE 145 FOR ANY PERSON, UNLESS HE IS ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS ITEM IN ANY WAY.



<p style="font-size: small;">Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com</p>	<p>Project</p> <p>473 PRESIDENT STREET</p> <p>BLOCK No. 440, LOT No. 1 BROOKLYN</p>	<p>Figure Title</p> <p>PILOT TEST PLAN</p>	<p>Project No.</p> <p>170361303</p>	<p>Figure No.</p> <p>1</p>
	<p>KINGS</p> <p>NEW YORK</p>	<p>Date</p> <p>5/6/2020</p>	<p>Drawn By</p> <p>VDP</p>	<p>Checked By</p> <p>PM</p>