BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

September 15, 2017

Mr. Anthony Lopes, P.E.
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2915

Re: 2424 Hamburg Turnpike Site
BCP Site No. C915296
Work Plan for Pilot Study: Dual Phase Extraction

Dear Mr. Lopes:

Benchmark Environmental Engineering & Science, PLLC (Benchmark) in association with TurnKey Environmental Restoration, LLC (TurnKey) has prepared this work plan to assess the design parameters for the Recommended Remedial Alternative for the 2424 Hamburg Turnpike Brownfield Cleanup Program (BCP) Site No. C915296 (Site; see Figures 1 & 2).

Based on the Remedial Investigation/Interim Remedial Measures/Alternatives Analysis (RI/IRM/AA) report, which is currently in public comment, the planned remedy is a Track 4 commercial/industrial cleanup that includes dual-phase extraction[1] (DPE) as a main component of the remedy. Therefore, we are proposing to perform a pilot study to assist our engineering analysis with regard to planned well numbers and spacing, depths, vapor and groundwater withdrawal rates, and treatment requirements.

DPE SYSTEM LAYOUT

Based on our preliminary layout of the DPE system provided in the RI/IRM/AA report dated August 2017, we have opted to perform the pilot study in the western central portion of the property as shown on Figure 3 (the DPE wells are at locations previously shown in the RI/IRM/AA report, Figure 6). We intend to install two DPE extraction wells (DPE-1 & DPE-2) and one piezometer (PZ-1). DPE-1 will serve as the extraction point, and DPE-2 will serve as a monitoring point as will PZ-1. The DPE wells and piezometers will be installed to a nominal depth of 9 feet below ground surface as shown on the details on Figure 4 (screen from 3 to 8 fbgs, sand pack from

[1] Dual-phase extraction refers to the removal of soil vapor and groundwater.

2 to 9 fbgs, and a surface seal consisting of a layer of bentonite chips and a cement grout surface seal)[2]. The DPE wells and piezometer will be installed with a nominal two foot stick-up. The DPE wells and PZ-1 will be developed to optimize water withdrawal. Upon completion of the well development, the groundwater from the DPE wells and the piezometer will be sampled for Target Compound List (TCL) volatile organic compounds (VOCs) via USEPA SW methodology to serve as a baseline and to assure that the wells are in the contaminated groundwater zone.

IMPLEMENTATION OF PILOT STUDY

A DPE trailer (outfitted with a dual-phase blower) and a frac tank will be mobilized to the Site. The blower will be plumbed to well DPE-1, which will serve as the extraction location. The groundwater extracted via the DPE system will be stored in a 21,000 gallon frac tank during the pilot test and will be treated and discharged in accordance with a temporary discharge permit with Erie County Sewer District #6 after the pilot test is completed.

Groundwater levels will be measured in all on-site wells to provide a basis for assessing the radius of influence of the groundwater extraction. The DPE blower will be activated and the vapor extraction rate will be adjusted consistent with normal blower operation, on the order of 30 to 50 cubic feet per minute (CFM); the blower is capable of extracting up to 200 CFM. The vacuum will be monitored using a portable manometer in PZ-1, DPE-2, MW-2 and MW-3 to assess the radius of influence of the vacuum induced. If the vacuum field induced is not significant as measured in PZ-1 or DPE-2, the ground surface will be sealed using 10-mil polyethylene liner, and will be secured from movement by placing sand bags strategically around the edges. In addition to measuring the vacuum field in the vadose zone, we will also monitor the air quality of the discharged air. Air samples will be collected at the onset and conclusion of the pilot study using Summa canisters, and analyzed by USEPA Method TO-15 plus tentatively identified compounds (TICs), gasoline range organics (GRO) and diesel range organics (DRO) by MADEP Air Phase Hydrocarbons (APH). At the time of Summa canister samples collection, contemporaneous photoionization detector (PID) readings will be made and the results compared to the analytical data which will serve as a surrogate to assess the air quality.

Extracted groundwater will be sampled from the holding tank (Refer to Figure 4) on the first day of DPE activation and upon completion of the pilot study. The samples will be tested for VOCs as described above. Results of the groundwater sampling will be used to assess treatment requirements for full-scale operations.

[2] All work described in this work plan will be done in accordance with the NYSDEC approved "Remedial Investigation/Alternative Analysis Work Plan" for the 2424 Hamburg Turnpike Site dated April 2016.

The pilot test will be run continuously for 5 to 10 days or until quasi-steady state conditions are achieved as determined by consistent vacuum measurements at the monitoring points (e.g., PZ-1 and DPE-2).

REPORTING/DESIGN

The results of the pilot study will be used to design full-scale operation of the DPE system which will include the number and spacing of DPE wells. Extracted vapor sample results will be modeled and using Division of Air Resources (DAR) DAR-1, the form of treatment (e.g., vapor phase carbon, biofilter), if necessary, and discharge requirements (i.e., stack height) will be proposed. In consultation with Erie County Sewer District No. 6, the pre-treatment requirements for the extracted groundwater will be determined and will be proposed accordingly (likely filtration followed by air stripping or carbon treatment) prior to discharge to the onsite sanitary sewer system. The results of the pilot test will be included as a chapter in the remedial action work plan.

Please contact us if you require anything further on the enclosed.

Sincerely,
TurnKey Environmental Restoration, LLC

Michael Lesakowski
Principal/Sr. Project Manager

Raymond F. Laport, P.E.
Senior Engineer

cc: Chad Staniszewski (NYSDEC Region 9 Hazardous Waste Remediation Engineer) (e-copy)

FIGURES

FIGURE 1

BENCHMARK ENVIRONMENTAL ENGINEERING & SCIENCE, PLLC
2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0599

SITE LOCATION & VICINITY MAP

DUAL PHASE EXTRACTION PILOT STUDY WORK PLAN

2424 HAMBURG TURNPIKE SITE

LACKAWANNA, NEW YORK

PREPARED FOR

2424 HAMBURG TURNPIKE, LLC

PROJECT NO.:	0345-015-001
DATE:	JULY 2017
DRAFTED BY:	CCB/RFL

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DRAFTED BY: CCB/RFL

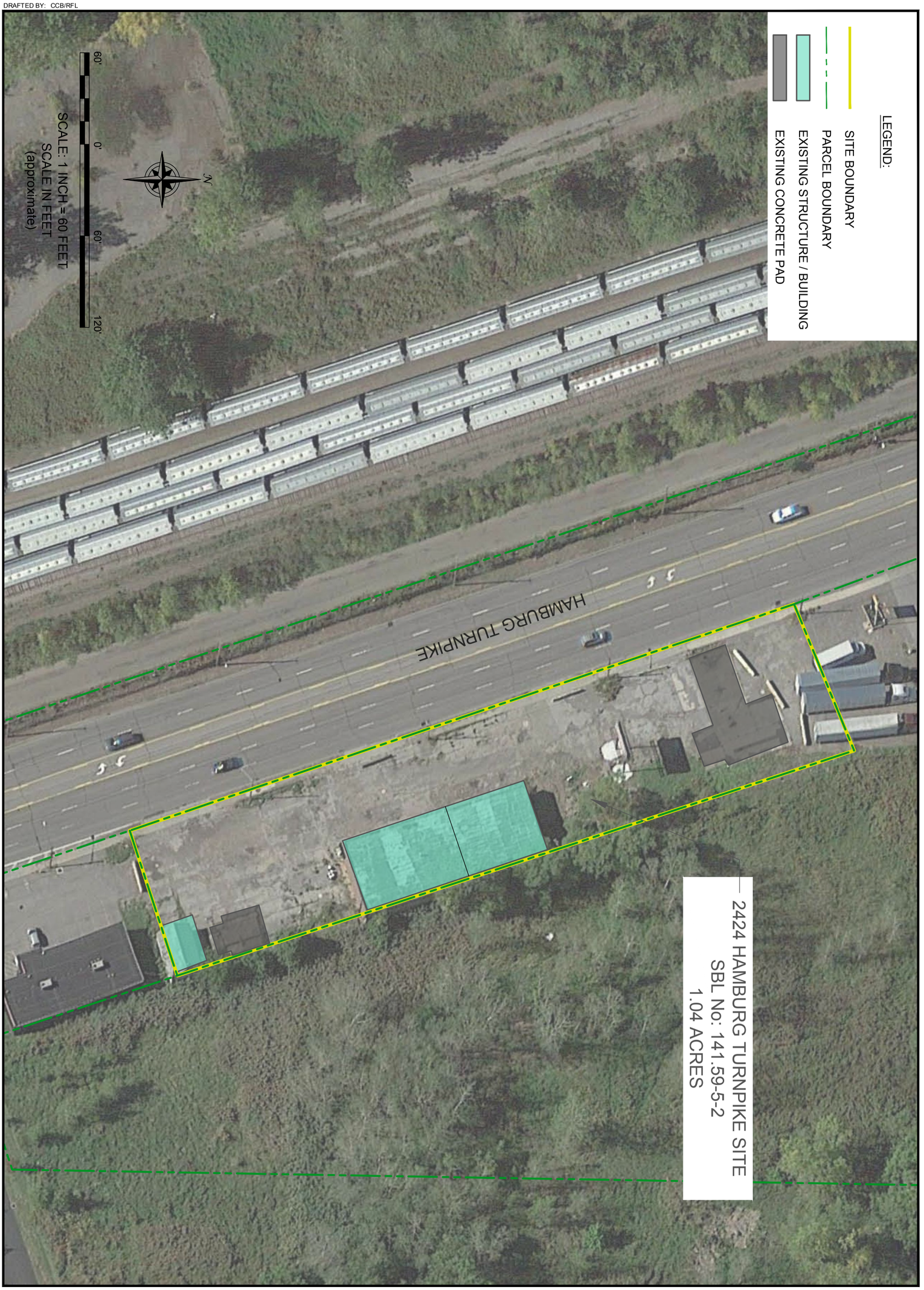

FIGURE 2

SITE PLAN (AERIAL)

DUAL PHASE EXTRACTION PILOT STUDY WORK PLAN

2424 HAMBURG TURNPIKE SITE

LACKAWANNA, NEW YORK

PREPARED FOR

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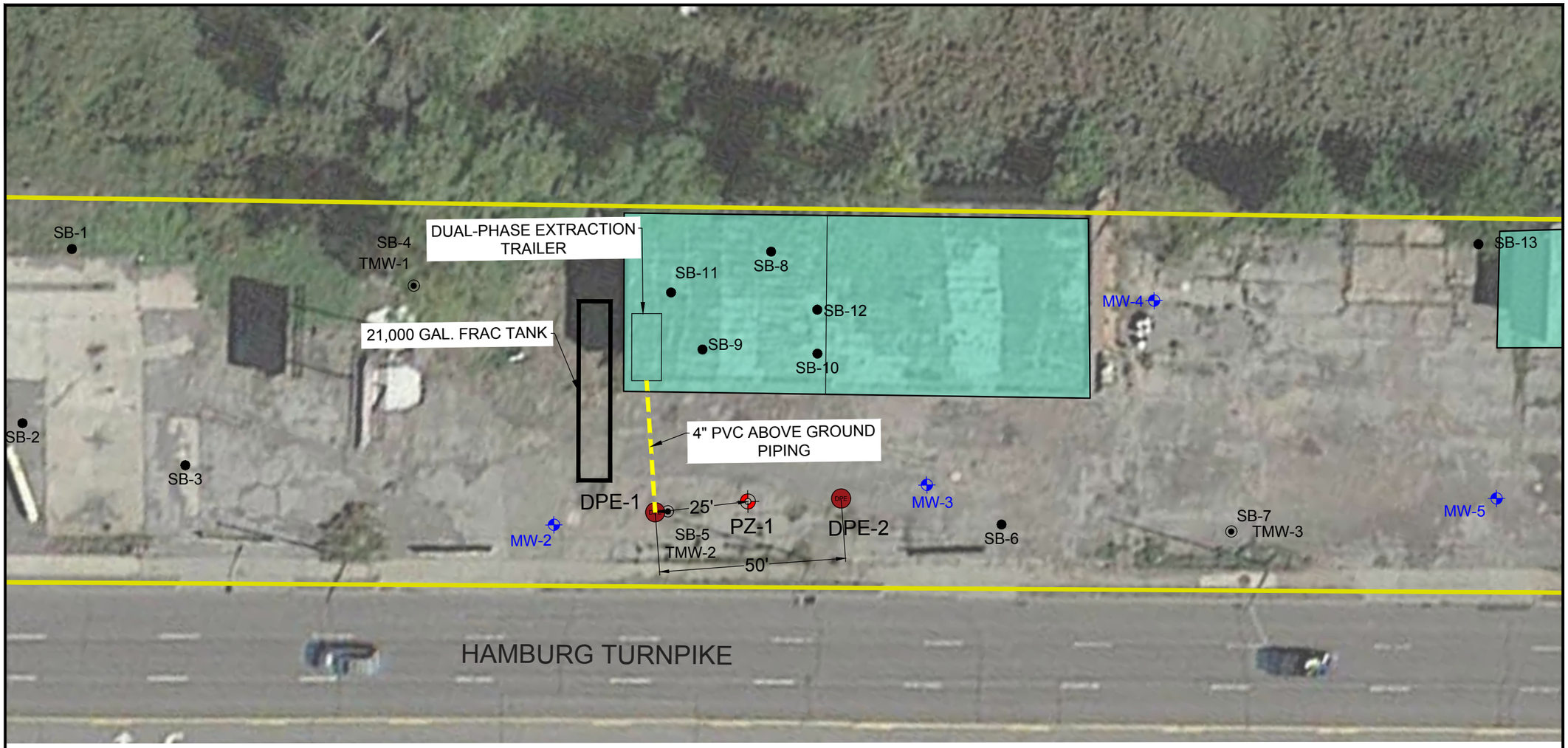
F:\CAD\Benchmark\2424 Hamburg Turnpike, LLC\DPE Pilot Study Work Plan\Figure 3: Planned Remedial Action.dwg, DWG To PDF.pc3



LEGEND:

- SITE BOUNDARY
- EXISTING STRUCTURE
- MW-1 — RI MONITORING WELL
- SB-1 — SOIL BORING
- SB-4 / TMW-1 — TEMPORARY MONITORING WELL (PHASE II - 2014)
- DPE-2 — PROPOSED DUAL PHASE EXTRACTION WELL
- PZ-1 — PROPOSED VADOSE ZONE PIEZOMETER

N

30' 0' 30' 60'

SCALE: 1 INCH = 30 FEET
SCALE IN FEET
(approximate)

DATE: AUGUST 2017
DRAFTED BY: RFL

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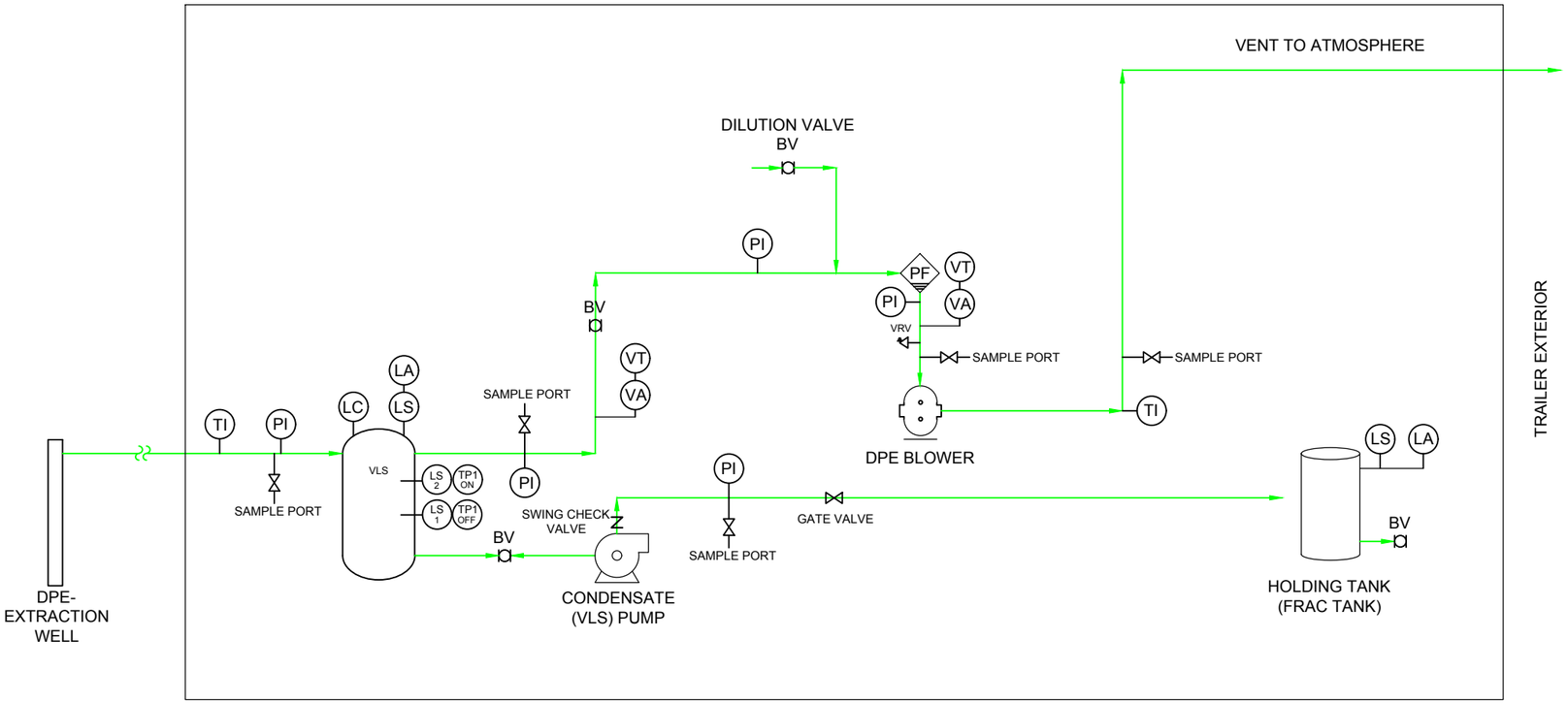
PILOT STUDY LAYOUT

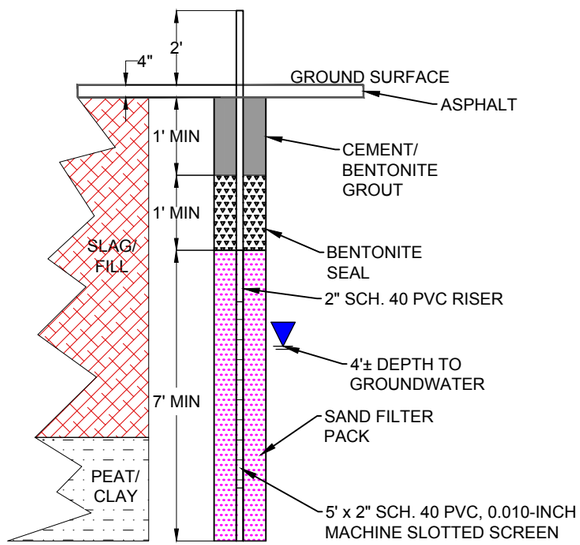
DUAL PHASE EXTRACTION PILOT STUDY WORK PLAN
2424 HAMBURG TURNPIKE SITE
LACKAWANNA, NEW YORK
PREPARED FOR
2424 HAMBURG TURNPIKE, LLC

FIGURE 3



LEGEND:

VRV	VACUUM RELIEF VALVE
PRV	PRESSURE RELIEF VALVE
LC	LEVEL CONTROL
LS	LEVEL SWITCH
LA	HIGH LEVEL ALARM
VA	LOW VACUUM ALARM
VT	ANALOG VACUUM TRANSMITTER
PI	PRESSURE (VACUUM) INDICATOR
FI	FLOW INDICATOR
TI	TEMPERATURE INDICATOR
BV	BALL VALVE
PF	PARTICULATE FILTER
TP	TRANSFER PUMP (ON/OFF FLOAT)
VLS	VAPOR LIQUID SEPARATOR
	VAPOR/CONDESATE WATER PIPING



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SVE PILOT STUDY DETAILS

DUAL PHASE EXTRACTION PILOT STUDY WORK PLAN

2424 HAMBURG TURNPIKE SITE
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FIGURE 4

DATE: AUGUST 2017
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