ARM Group LLC
Engineers and Scientists

March 8, 2021

Ms. Barbara Brown
Project Coordinator
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Re: RADWP Addendum:
Supplemental Sampling Plan – 2nd Round
Area A: Sub-Parcel A8-2
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown:

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic (TPA), is proposing to conduct a second round of supplemental soil sampling within Sub-Parcel A8-2 (the Site), which is part of Area A of the TPA property located in Sparrows Point, Maryland. This Response and Development Work Plan (RADWP) Addendum presents a supplemental sampling plan to provide additional characterization data to evaluate conditions along the access road at the Site. The previous submission of the Sub-Parcel A8-2 RADWP (Revision 1 dated September 15, 2020) was approved by the Maryland Department of the Environment (MDE) via email on September 25, 2020 with contingencies related to the access road and supplemental sampling along the shoulders and median. Supplemental soil sampling was subsequently proposed in a RADWP Addendum (dated September 25, 2020). This soil sampling was completed on October 20, 2020. Based on the soil sampling results, this Work Plan proposes further sampling to assess Composite Worker and Construction Worker risk along the road.

A total of 10 additional soil borings, shown on **Figure 1**, are proposed along the northeastern access road within Sub-Parcel A8-2 to supplement existing soil data in the implementation of a Screening Level Risk Assessment (SLRA). The SLRA will evaluate Composite Worker and Construction Worker risk and be prepared and presented to the MDE and United States Environmental Protection Agency (USEPA) upon receipt of the supplemental data.

This document proposes the protocols to be followed during the sampling activities. All soil sampling will be conducted in accordance with the Standard Operating Procedures (SOPs) and requirements given in the property-wide Quality Assurance Project Plan (QAPP). Analytical methods, sample containers, preservatives, and holding times for the sample analyses are listed in

the QAPP Worksheet 19 & 30 – Sample Containers, Preservation, and Holding Times. The investigation will be conducted under the property-wide Health and Safety Plan (HASP).

Sampling activities are proposed to supplement existing data used to assess the risk to the future Composite Worker and Construction Worker. A total of 10 soil boring locations are proposed to be completed at the locations shown on **Figure 1**. Each boring will be completed using a Geoprobe® direct push rig. Soil samples will be screened, collected, and analyzed in accordance with procedures referenced in the QAPP Worksheet 21 – Field SOPs, SOP No. 009 – Sub-Surface Soil Sampling and SOP No. 008 – Surface Soil Sample Collection. Soil borings will be completed to a depth of 10 feet below ground surface (bgs).

In order to fully characterize surficial soil conditions, the top 2 feet of material recovered from each boring (i.e., the 0 to 2 foot interval) will be homogenized. The sampling interval will be homogenized to create a representative sample from 0 to 2 feet by mixing in a decontaminated or dedicated glass or stainless-steel bowl. The homogenized sample will contain an equal volume of soil from throughout the vertical interval. At each boring location, the top sample interval will be adjusted downward if pavement or recycled concrete is present at the surface. Two additional underlying samples will be collected from each soil boring at the 4 to 5 foot depth interval and the 9 to 10 foot depth interval if groundwater has not been encountered. It should be noted that no soil samples will be collected from a depth that is below the water table. If the photoionization detector (PID) or other field observations indicate contamination to exist at a depth greater than 3 feet bgs but less than 9 feet bgs, and above the water table, the sample from the 4 to 5 foot interval may be shifted to the depth interval indicated by the PID response.

The existing data evaluated in the SLRA within the RADWP, as well as the supplemental data collected under the RADWP Addendum, shown on **Figure 1**, indicate that the primary risk drivers on Sub-Parcel A8-2 are polynuclear aromatic hydrocarbons (PAHs) and metals. Organic and inorganic detection summary tables with the results from the three soil borings completed during the prior round of supplemental sampling are provided as **Table 1** and **Table 2**, respectively. Therefore, each soil sample that will be collected to supplement the existing data will be analyzed for PAHs via USEPA Method 8270 SIM and Target Analyte List (TAL) Metals via USEPA Method 6010. The 10-foot bgs samples will be held prior to analysis and released (if appropriate) in accordance with standard procedures (depending on overlying Project Action Limit (PAL) exceedances and/or elevated PID readings).

Any soil waste generated during the supplemental sampling activities will be placed in designated drums and characterized for PCBs and TCLP parameters (VOCs, SVOCs, and metals) to determine the appropriate disposal requirements. Any (minimal) aqueous waste generated from decontamination fluids, etc. will be managed in bulk with waste from other investigations and will be appropriately characterized prior to disposal.

The findings of this investigation will be incorporated into a SLRA Report that will supplement the previous Sub-Parcel A8-2 RADWP SLRA and address both Composite Worker and

Construction Worker risk scenarios for both exposure units (EUs), the main area of Sub-Parcel A8-2 (EU1) and the access road (EU2), to determine if risk levels are acceptable within the Site and inform the extent of potential capping requirements.

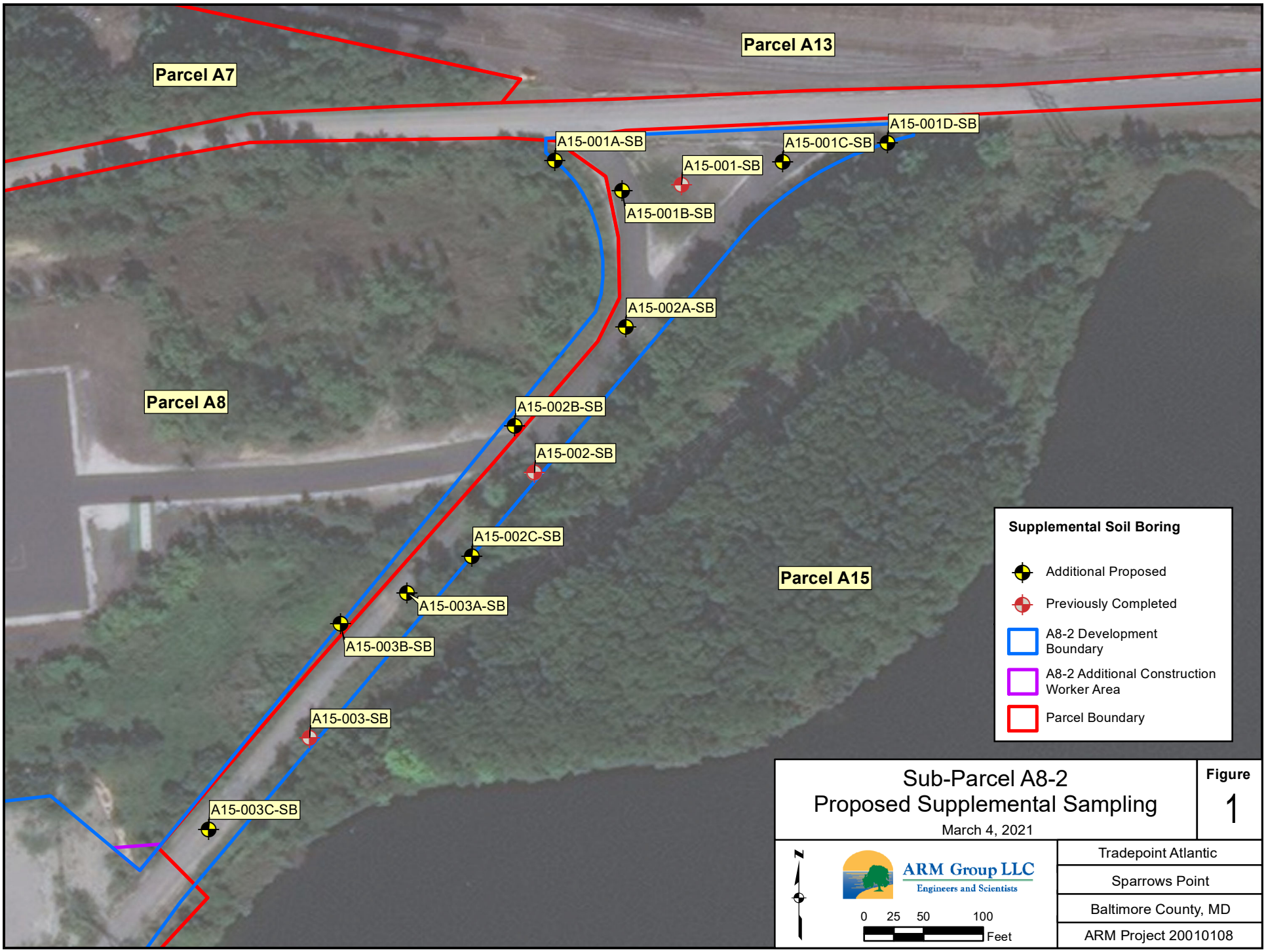
If you have any questions, or if we can provide any additional information at this time, please do not hesitate to contact ARM Group LLC at 410-290-7775.

Respectfully Submitted,
ARM Group LLC

Joshua M. Barna, G.I.T.
Staff Geologist

T. Neil Peters, P.E.
Senior Vice President
QA Reviewer

FIGURES


Parcel A13
Parcel A7
A15-001D-SB
A15-001A-SB
A15-001C-SB
A15-001-SB
A15-001B-SB
A15-002A-SB
Parcel A8
A15-002B-SB
A15-002-SB
A15-002C-SB
Parcel A15
A15-003A-SB
A15-003B-SB
A15-003-SB
A15-003C-SB
Supplemental Soil Boring
Additional Proposed
Previously Completed
A8-2 Development Boundary
A8-2 Additional Construction Worker Area
Parcel Boundary
Sub-Parcel A8-2
Proposed Supplemental Sampling
March 4, 2021
Figure
1
ARM Group LLC
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Feet
Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 20010108

TABLES

Table 1 - Sub-Parcel A8-2 Supplemental Sampling
Summary of Organics Detected in Soil

Parameter	Units	PAL	A15-001-SB-1* 10/20/2020	A15-001-SB-5* 10/20/2020	A15-002-SB-1* 10/20/2020	A15-002-SB-5* 10/20/2020	A15-003-SB-1* 10/20/2020	A15-003-SB-4* 10/20/2020	A15-003-SB-10* 10/20/2020
Volatile Organic Compounds									
Acetone	mg/kg	670,000	N/A	0.0085 U	N/A	N/A	0.0082 U	**0.011**	0.0096 U
Carbon disulfide	mg/kg	3,500	N/A	0.0042 U	N/A	N/A	**0.0016 J**	**0.0021 J**	0.0048 U
Semi-Volatile Organic Compounds^									
1,1-Biphenyl	mg/kg	200	0.075 U	0.08 U	0.081 U	0.08 U	0.071 U	**0.038 J**	0.079 U
2-Methylnaphthalene	mg/kg	3,000	0.0075 U	0.0078 U	0.0083 U	0.008 U	**0.019**	**0.054**	0.0085 U
Acenaphthene	mg/kg	45,000	0.0075 U	0.0078 U	0.0083 U	0.008 U	**0.0019 J**	**0.0025 J**	0.0085 U
Acenaphthylene	mg/kg	45,000	0.0075 U	0.0078 U	0.0083 U	0.008 U	**0.003 J**	**0.018**	0.0085 U
Acetophenone	mg/kg	120,000	0.075 U	0.08 U	0.081 U	0.08 U	0.071 U	**0.022 J**	0.079 U
Anthracene	mg/kg	230,000	**0.00086 J**	0.0078 U	0.0083 U	**0.002 J**	**0.0063 J**	**0.015**	0.0085 U
Benz[a]anthracene	mg/kg	21	**0.0038 J**	0.0078 U	0.0083 U	**0.00088 J**	**0.022**	**0.095**	0.0085 U
Benzo[a]pyrene	mg/kg	2.1	**0.0044 J**	0.0078 U	0.0083 U	0.008 U	**0.026**	**0.093**	0.0085 U
Benzo[b]fluoranthene	mg/kg	21	**0.0055 J**	0.0078 U	0.0083 U	0.008 U	**0.032**	**0.12**	0.0085 U
Benzo[g,h,i]perylene	mg/kg		**0.003 J**	0.0078 U	0.0083 U	0.008 U	**0.017**	**0.064**	0.0085 U
Benzo[k]fluoranthene	mg/kg	210	**0.0025 J**	0.0078 U	0.0083 U	0.008 U	**0.012**	**0.046**	0.0085 U
bis(2-Ethylhexyl)phthalate	mg/kg	160	**0.016 J**	**0.023 J**	0.081 U	**0.02 J**	**0.021 J**	**0.027 J**	**0.02 J**
Carbazole	mg/kg		0.075 U	0.08 U	0.081 U	0.08 U	0.071 U	**0.026 J**	0.079 U
Chrysene	mg/kg	2,100	**0.0036 J**	0.0078 U	0.0083 U	**0.00064 J**	**0.022**	**0.091**	0.0085 U
Dibenz[a,h]anthracene	mg/kg	2.1	**0.00097 J**	0.0078 U	0.0083 U	0.008 U	**0.0053 J**	**0.02**	0.0085 U
Di-n-butylphthalate	mg/kg	82,000	**0.02 J**	**0.034 J**	**0.024 J**	**0.032 J**	**0.023 J**	**0.031 J**	**0.031 J**
Fluoranthene	mg/kg	30,000	**0.0053 J**	0.0078 U	0.0083 U	**0.0038 J**	**0.033**	**0.13**	0.0085 U
Fluorene	mg/kg	30,000	0.0075 U	0.0078 U	0.0083 U	**0.0022 J**	**0.0023 J**	**0.0047 J**	0.0085 U
Indeno[1,2,3-c,d]pyrene	mg/kg	21	**0.0039 J**	0.0078 U	0.0083 U	0.008 U	**0.022**	**0.086**	0.0085 U
Naphthalene	mg/kg	8.6	**0.003 J**	0.0078 U	0.0083 U	0.008 U	**0.081**	**0.5**	0.0085 U
Phenanthrene	mg/kg		**0.0026 J**	0.0078 U	0.0083 U	**0.0096**	**0.023**	**0.055**	0.0085 U
Pyrene	mg/kg	23,000	**0.0045 J**	0.0078 U	0.0083 U	**0.003 J**	**0.033**	**0.12**	0.0085 U
TPH/Oil & Grease									
Diesel Range Organics	mg/kg	6,200	**17.2**	**10.1**	**12**	**8.1 J**	**36.9**	**212**	**6.6 J**
Oil & Grease	mg/kg	6,200	456 U	484 U	496 U	498 U	214 U	**328**	475 U

Bold indicates detection
Values in red indicate a detection exceedance of the Project Action Limit (PAL)
* Indicates non-validated data

^ PAH compounds were analyzed via SIM
N/A: This parameter was not analyzed for this sample.
J: The positive result reported for this analyte is a quantitative estimate.
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.

Table 2 - Sub-Parcel A8-2 Supplemental Sampling
Summary of Inorganics Detected in Soil

Parameter	Units	PAL	A15-001-SB-1* 10/20/2020	A15-001-SB-5* 10/20/2020	A15-001-SB-10* 10/20/2020	A15-002-SB-1* 10/20/2020	A15-002-SB-5* 10/20/2020	A15-003-SB-1* 10/20/2020	A15-003-SB-4* 10/20/2020	A15-003-SB-10* 10/20/2020
Metals										
Aluminum	mg/kg	1,100,000	**13,600**	**12,100**	N/A	**15,600**	**13,400**	**10,100**	**12,300**	N/A
Arsenic	mg/kg	3	**6.7**	**6.4**	**3.6**	**9.1**	**11.9**	2.2 U	2.3 U	N/A
Barium	mg/kg	220,000	**51.9**	**60.4**	N/A	**107**	**29.4**	**198**	**146**	N/A
Beryllium	mg/kg	2,300	**0.53 J**	**0.87 J**	N/A	**0.85 J**	**0.71 J**	**0.83 J**	**0.86 J**	N/A
Cadmium	mg/kg	980	1.3 U	1.5 U	N/A	1.5 U	1.5 U	**1.1 J**	**1.8**	N/A
Chromium	mg/kg	120,000	**21.4**	**21.6**	N/A	**28.5**	**25.4**	**1,620**	**2,890**	N/A
Chromium VI	mg/kg	6.3	1.1 U	1.2 U	N/A	1.2 U	1.2 U	**0.73 J**	**1 J**	N/A
Cobalt	mg/kg	350	**6.4**	**7.5**	N/A	**7**	**5.6**	**2.6 J**	**5.8**	N/A
Copper	mg/kg	47,000	**10.7**	**10.4**	N/A	**16.7**	**16.3**	**58.7**	**65.4**	N/A
Iron	mg/kg	820,000	**20,800**	**19,500**	N/A	**29,600**	**30,200**	**156,000**	**196,000**	N/A
Lead	mg/kg	800	**16.1**	**11.9**	N/A	**14.2**	**13**	**41.8**	**108**	N/A
Manganese	mg/kg	26,000	**274**	**67.4**	N/A	**75.1**	**62.9**	**49,400**	**46,500**	**50.1**
Mercury	mg/kg	350	**0.069 J**	0.11 U	N/A	0.12 U	0.12 U	**0.011 J**	**0.69**	N/A
Nickel	mg/kg	22,000	**11.2**	**14.9**	N/A	**17.8**	**14.7**	**15.7**	**29.1**	N/A
Thallium	mg/kg	12	8.8 U	9.7 U	N/A	9.7 U	9.9 U	**56.3**	**53.2**	N/A
Vanadium	mg/kg	5,800	**35.2**	**30.6**	N/A	**35.3**	**33.8**	**3,410**	**3,550**	N/A
Zinc	mg/kg	350,000	**46**	**39.1**	N/A	**52.6**	**41.9**	**239**	**259**	N/A
Other										
Cyanide	mg/kg	150	1.1 U	1 U	N/A	1.1 U	1 U	**0.27 J**	**1.9**	N/A

Bold indicates detection
Values in red indicate a detection exceedance of the Project Action Limit (PAL)
N/A: This parameter was not analyzed for this sample.

* Indicates non-validated data
U: This analyte was not detected in the sample. The numeric value represents the sample quantitation/detection limit.
J: The positive result reported for this analyte is a quantitative estimate.