



ARM Group LLC

Engineers and Scientists

November 11, 2021

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

Re: RADWP Addendum: SLRA
Area B: Sub-Parcel B4-2 – Revision 1
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown:

ARM Group LLC (ARM), on behalf of Tradepoint Atlantic (TPA), is submitting this Response and Development Work Plan (RADWP) Addendum to assess future Composite Worker and Construction Worker risks within southern expansion of Sub-Parcel B4-2 (the Site), which is part of Area B of the TPA property located in Sparrows Point, Maryland. The original scope of development work was presented to the Maryland Department of the Environment (MDE) and United States Environmental Protection Agency (USEPA) in the Sub-Parcel B4-2 RADWP (Revision 0 dated September 15, 2020). The scope of development was subsequently reduced through submission of the revised RADWP (Revision 1 dated September 22, 2020) to include only the northern portion of the Sub-Parcel. This RADWP Addendum proposes completion of the previously proposed southern expansion of Sub-Parcel B4-2 and presents the results of a Screening Level Risk Assessment (SLRA) that has been completed to assess Composite Worker and Construction Worker risks for this area.

As shown on **Figure 1**, the southern expansion of Sub-Parcel B4-2 consists of approximately 32.5 acres located primarily within Parcel B18, but extending slightly into Parcel B4, Parcel B5, and Parcel B10, of the approximately 3,100-acre former steel plant property. The southern expansion of Sub-Parcel B4-2 is slated for development and use as an Automotive Roll-On, Roll-Off (RORO) Distribution Center. Outside of the main development area, an external construction area (not intended for permanent use or occupancy) with a total area of 2.90 acres within the Limit of Disturbance (LOD) will be utilized to accommodate construction of an access road. Development plans for the expansion are provided as **Attachment 1** and shown on **Figure 2**. The revised RADWP already specified a remedy consisting of in-place containment with surface engineering controls (i.e., capping) to be protective of Composite Workers in the northern portion of Sub-Parcel B4-2. The remedy details are specified in the Sub-Parcel B4-2 RADWP (Revision 1 dated September 22, 2020). **Figure 3** presents the locations of relevant soil borings completed during

the original Parcel B4, Parcel B5, and Parcel B18 Phase II Investigations. Semi-volatile organic compound (SVOC) and inorganic project action limit (PAL) exceedances within the Sub-Parcel B4-2 southern expansion are shown on **Figure 4** and **Figure 5**, respectively.

SLRA ANALYSIS PROCESS

A human health SLRA has been completed for the Composite Worker and Construction Worker scenarios based on the analytical data obtained from the characterization of surface and subsurface soils in the Sub-Parcel B4-2 southern expansion.

The SLRA included the following evaluation process:

Identification of Exposure Units (EUs): The southern expansion Composite Worker SLRA was evaluated using a site-wide EU (designated as EU1) with an area of 32.5 acres. The Construction Worker SLRA was evaluated using a similar EU (designated as EU1-EXP to recognize the surrounding temporary construction zones) with an area of 35.4 acres.

Identification of Constituents of Potential Concern (COPCs): For the project-specific SLRA, compounds that were present at concentrations at or above the USEPA Regional Screening Levels (RSLs) set at a target cancer risk of 1E-6 or target non-cancer Hazard Quotient (HQ) of 0.1 were identified as COPCs to be included in the SLRA. A COPC screening analysis is provided in **Table 1** to identify compounds above the relevant screening levels.

Exposure Point Concentrations (EPCs): The COPC soil datasets for the site-wide EU were divided into surface (0 to 2 foot), subsurface (>2 foot), and pooled depths for estimation of potential EPCs. Thus, there are three soil datasets associated with the site-wide EU. A statistical analysis was performed for each COPC dataset using the ProUCL software (version 5.1) developed by the USEPA to determine representative reasonable maximum exposure (RME) values for the EPC for each constituent. The RME value is typically the 95% Upper Confidence Limit (UCL) of the mean. For lead, the arithmetic mean for each depth was calculated for comparison to the Adult Lead Model (ALM)-based values, and any results above 10,000 mg/kg would be delineated for possible excavation and removal (not applicable at this Site). For PCBs, all results above 50 mg/kg would be delineated for excavation and removal (not applicable at this Site).

Risk Ratios: The surface soil EPCs, subsurface soil EPCs, and pooled soil EPCs were compared to the USEPA RSLs for the Composite Worker and to site-specific Soil Screening Levels (SSLs) for the Construction Worker based on equations derived in the USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (OSWER 9355.4-24, December 2002). Risk ratios were calculated with a cancer risk of 1E-6 and a non-cancer HQ of 1. The risk ratios for the carcinogens were summed to develop a screening level estimate of the baseline cumulative cancer risk. The risk ratios



for the non-carcinogens were segregated and summed by target organ to develop a screening level estimate of the baseline cumulative non-cancer Hazard Index (HI).

For the Construction Worker, site-specific risk-based evaluations were completed for a range of potential exposure frequencies to determine the maximum exposure frequency for EU1-EXP that would result in risk ratios equivalent to a cumulative cancer risk of 1E-5 or HI of 1 for the individual target organs. This analysis indicated that the allowable exposure frequency before additional worker protections or more detailed job safety evaluations might be needed is 55 days.

There is no potential for direct human exposure to groundwater for a Composite Worker since groundwater is not used on the TPA property (and is not proposed to be utilized). In the event that any future construction/excavation leads to a potential Construction Worker exposure to groundwater during development, health and safety plans and management procedures shall be followed to limit exposure risk. Groundwater is not expected to be encountered during the proposed development activities, however, if groundwater is encountered, dewatering will be implemented as described in the main RADWP.

Assessment of Lead: For lead, the arithmetic mean concentrations for surface soils, subsurface soils, and pooled soils for EU1 and EU1-EXP were compared to the applicable RSL (800 mg/kg) as an initial screening. If the mean concentrations for the EU were below 800 mg/kg, the Site was identified as requiring no further action for lead. If a mean concentration exceeded the RSL, the mean values were compared to calculated ALM values (ALM Version dated 6/21/2009 updated with the 5/17/2017 OLEM Directive) with inputs of 1.8 for the geometric standard deviation and a blood baseline lead level of 0.6 ug/dL. The ALM calculation generates a soil lead concentration of 1,050 mg/kg, which is the most conservative (i.e., lowest) concentration which would yield a probability of 5% of a blood lead concentration of 5 ug/dL. If the arithmetic mean concentrations were below 1,050 mg/kg, the Site was identified as requiring no further action for lead. The average and maximum lead concentrations are presented for surface, subsurface, and pooled soils in **Table 2**. None of the arithmetic mean lead concentrations exceeded the initial screening threshold of 800 mg/kg, indicating no further action is needed with respect to lead.

Assessment of TPH/Oil & Grease: EPCs were not calculated for TPH/Oil & Grease. Instead, the individual soil results were compared to the TPH/Oil & Grease PAL set to a HQ of 1 (6,200 mg/kg). No soil boring locations within, or adjacent to, the proposed development boundary exceeded the TPH/Oil & Grease PAL. However, two locations (B18-034-SB and B18-074-SB) showed indications of NAPL in the soil cores. Detailed TPH/Oil & Grease and NAPL results can be found in the Parcel B4, Parcel B5, and Parcel B18 Phase II Investigation Reports. The soil borings with physical evidence of NAPL are plotted with respect to the proposed development plan (including utilities) on **Figure 6**. As shown on this figure, soil boring B18-034-SB is proximate to a proposed storm drain.



Contingency measures to address the potential presence of NAPL that could be encountered during construction are addressed in the main RADWP.

Risk Characterization Approach: If the baseline risk ratio for each non-carcinogenic COPC or cumulative target organ does not exceed 1, and the sum of the risk ratios for the carcinogenic COPCs does not exceed a cumulative cancer risk of $1E-5$, then a no further action determination will be recommended. If the baseline estimate of cumulative cancer risk exceeds $1E-5$ but is less than or equal to $1E-4$, then capping of the EU will be considered an acceptable remedy for the Composite Worker. The efficacy of capping for elevated non-cancer hazard will be evaluated in terms of the magnitude of exceedance and other factors such as bioavailability of the COPC. For the Construction Worker, cumulative cancer risks exceeding $1E-5$ (but less than or equal to $1E-4$) or HI values exceeding 1 will be mitigated via site-specific health and safety requirements.

The USEPA's acceptable risk range is between $1E-6$ and $1E-4$. If the sum of the risk ratios for carcinogens exceeds a cumulative cancer risk of $1E-4$, further analysis of site conditions will be required including the consideration of toxicity reduction in any proposal for a remedy. The magnitude of any non-carcinogen HI exceedances and bioavailability of the COPC will also dictate further analysis of site conditions including consideration of toxicity reduction in any proposal for a remedy.

SLRA RESULTS AND RISK CHARACTERIZATION

Soil data were divided into three datasets (surface, subsurface, and pooled) for Sub-Parcel B4-2 to evaluate potential exposure scenarios. Each of these potential exposure scenarios is relevant for both the Composite Worker and Construction Worker.

EPCs were calculated for each soil dataset (i.e., surface, subsurface, and pooled depths) for both EU1 and EU1-EXP. ProUCL output tables (with computed UCLs) derived from the data for each COPC in soils are provided as electronic attachments, with EPCs calculated for COPCs within each of the datasets. The ProUCL input tables are also included as electronic attachments. The results were evaluated to identify any samples that may require additional assessment or special management based on the risk characterization approach. The calculated EPCs for the surface, subsurface, and pooled exposure scenarios are provided in **Table 3**. These EPCs were used for both the Composite Worker and Construction Worker assessments.

As indicated above, the EPCs for lead are the average (i.e., arithmetic mean) values for each dataset. A lead evaluation spreadsheet, providing the computations to determine lead averages for each dataset, is also included as an electronic attachment. The screening criterion for lead was set at an arithmetic mean of 800 mg/kg based on the RSL, with a secondary limit of 1,050 mg/kg based on the May 2017 updated ALM developed by the USEPA (corresponding to a 5% probability of a blood lead level of 5 ug/dL). The average and maximum lead concentrations are



presented for each dataset in **Table 2**, which indicates that neither surface, subsurface, nor pooled soils exceeded an average lead value of 800 mg/kg.

Composite Worker Assessment:

Risk ratios for the estimates of potential EPCs for the Composite Worker scenario for EU1 are shown in **Table 4** (surface), **Table 5** (subsurface), and **Table 6** (pooled soils). The results are summarized as follows:

Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Composite Worker	EU1 (32.5 acres)	Surface Soil	none	3E-6
		Subsurface Soil	none	5E-5
		Pooled Soil	none	1E-5

Based on the risk ratios for the Sub-Parcel B4-2 southern expansion, environmental capping (100% of the Site) is an acceptable remedy to be protective of future Composite Workers for the surface, subsurface, and pooled exposure scenarios. None of the non-carcinogenic HI values exceeded 1. However, the carcinogenic risk estimate for the Composite Worker subsurface exposure scenario was greater than the acceptable risk level of 1E-5 but did not exceed the secondary risk level 1E-4. Benzo[a]pyrene is the main driver of risk for subsurface soils. Capping and institutional controls (to maintain the integrity of the cap) are suitable measures for the protection of the future Composite Worker for both cancer risks and non-cancer hazards. The capping remedy will additionally protect against exposure to slag aggregate that will be placed on the Site and will be used as the primary fill material and pavement subbase. Details regarding the implementation and maintenance of the capping remedy are included in the main RADWP.

Construction Worker Assessment:

Ground intrusive activities which could result in potential Construction Worker exposures are expected to be limited primarily to utility installation tasks performed by specific work crews. Construction Worker risks were evaluated for several different exposure scenarios to determine the maximum exposure frequency for EU1-EXP that would result in risk ratios equivalent to a cumulative cancer risk of 1E-5 or HI of 1 for any individual target organ. Risk ratios for the Construction Worker scenario using the selected duration (55 days) are shown in **Table 7** (surface), **Table 8** (subsurface), and **Table 9** (pooled). The variables entered for calculation of the site-specific Construction Worker SSLs (EU area, input assumptions, and exposure frequency) are indicated as notes on the tables. The spreadsheet used for computation of the site-specific Construction Worker SSLs is included as **Attachment 2**. The results are summarized as follows:



Worker Scenario	Exposure Unit	Medium	Hazard Index (>1)	Total Cancer Risk
Construction Worker	EU1-EXP (35.4 acres) (55 exposure days)	Surface Soil	none	2E-7
		Subsurface Soil	none	2E-6
		Pooled Soil	none	4E-7

Using the selected exposure duration of 55 days, the carcinogenic risks were all less than 1E-5, and none of the non-carcinogens caused a cumulative HI to exceed 1 for any target organ system. These findings are below the acceptable limits for no further action established by the agencies. This evaluation indicates that additional site-specific health and safety requirements (beyond standard Level D protection) would be required only if the allowable exposure duration of 55 days were to be exceeded for an individual worker.

In the event that this exposure day limit would be exceeded, additional site-specific health and safety requirements would be warranted to be protective of Construction Workers during intrusive work. While the SLRA indicated no unacceptable risks to the Construction Worker for an exposure duration of up to 55 days, upgraded Personal Protective Equipment (PPE) beyond standard Level D protection will be used for the entire scope of intrusive work covered by this RADWP Addendum as a protective measure. The modified Level D PPE requirements which will be applied during this project, as described in the Sub-Parcel B4-2 RADWP (Revision 1 dated September 22, 2020). As specified in the RADWP, institutional controls will be required to be established for the protection of future Construction Workers in the event of any future long-term development which could include intrusive activities.

IMPLEMENTATION SCHEDULE

Progress reports will be submitted to the MDE on a quarterly basis. Each quarterly progress report will include, at a minimum, a discussion of the following information regarding tasks completed during the specified quarter:

- Development Progress
- Dust Monitoring
- Water Management
- Soil Management (imported materials, screening, stockpiling)
- Soil Sampling and Disposal
- Notable Occurrences (if applicable)
- Additional Associated Work (if applicable)

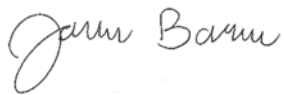
The proposed implementation schedule is shown below:



Task	Proposed Completion Date
Anticipated RADWP Approval	December 15, 2021
<i>Development:</i>	
Installation of Erosion and Sediment Controls	December 2021
Site Preparation	December 2021
Slag (or Alternative Fill) Delivery and Placement	December 2021
Site Grading	December 2021
Utility Installations	January 2022
Submittal of Development Completion Report/ Notice of Completion of Remedial Actions*	July 2022
Request for NFA from the MDE	October 2022

If you have questions regarding any information covered in this document, please feel free to contact ARM Group LLC at (410) 290-7775.

Respectfully Submitted,
ARM Group LLC



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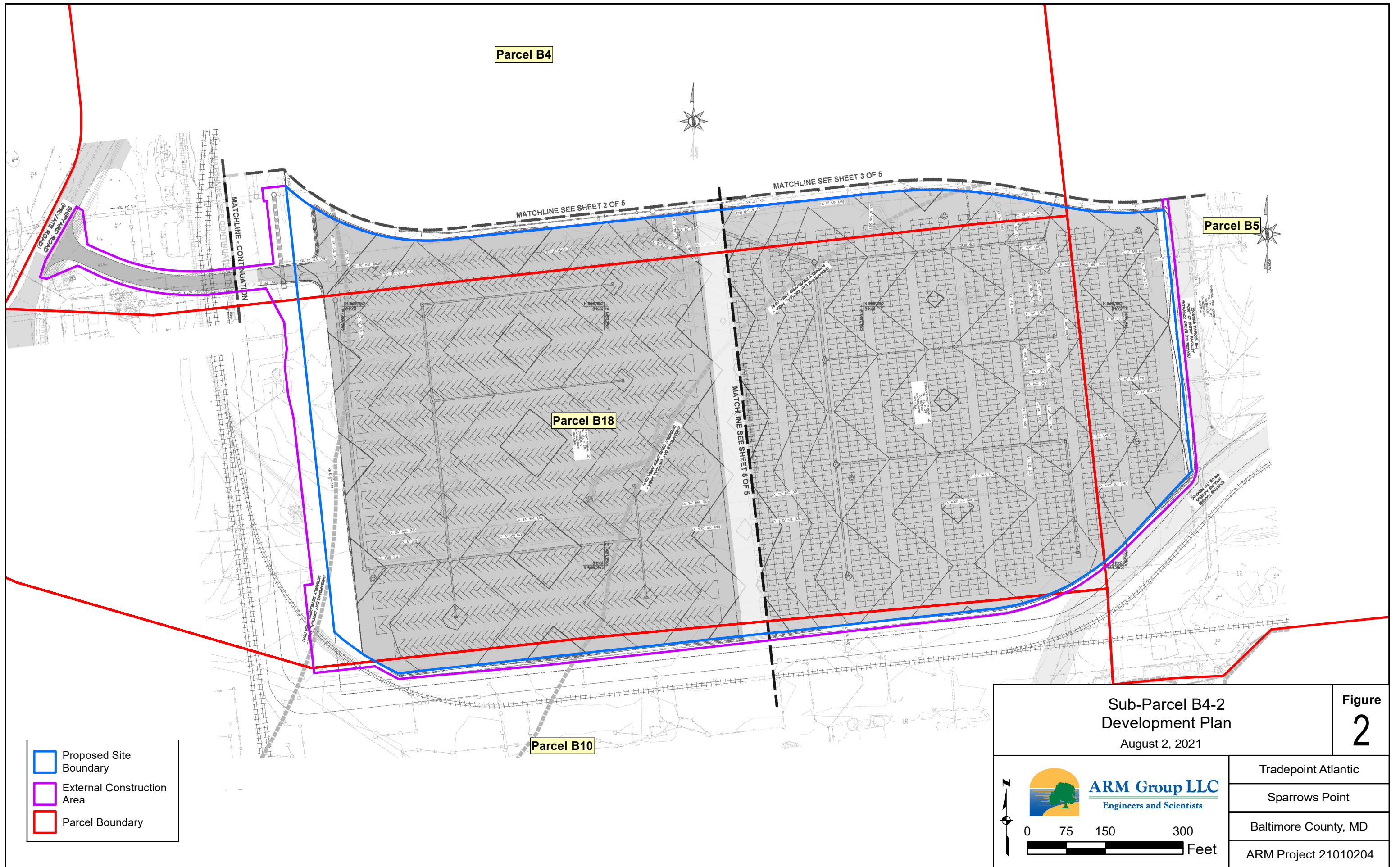


FIGURES



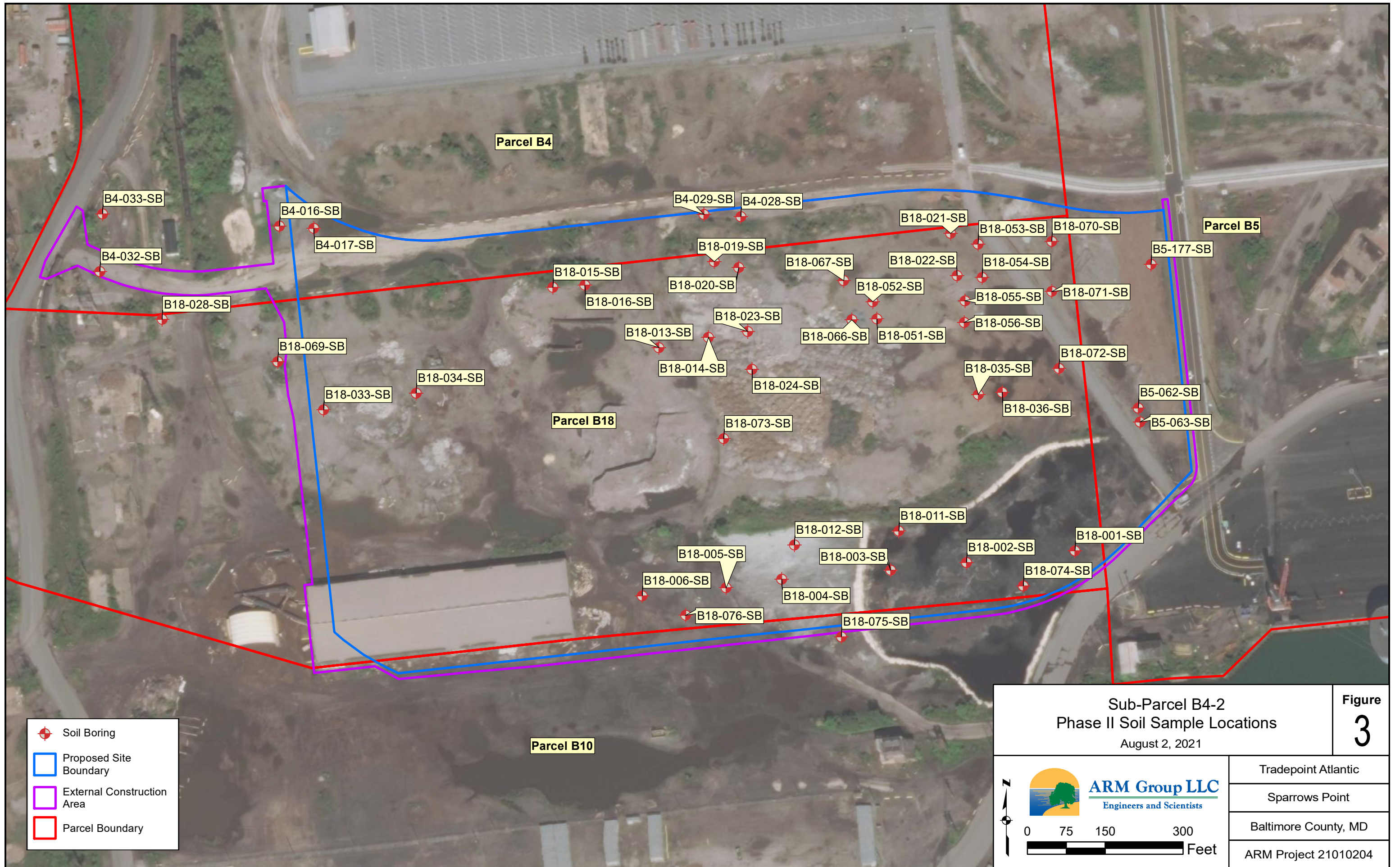
- Sub-Parcel B4-2 Expansion Boundary
- Site Boundary
- Parcel Boundaries
- Private Property

Tradepoint Atlantic Area A and Area B Parcels August 2, 2021		Figure 1
ARM Group LLC Engineers and Scientists		Tradepoint Atlantic Sparrows Point Baltimore County, MD
		Area A: Project 210101 Area B: Project 210102 B4-2: Project 21010204



- Proposed Site Boundary
- External Construction Area
- Parcel Boundary

<p>Sub-Parcel B4-2 Development Plan August 2, 2021</p>		<p>Figure 2</p>
<p>ARM Group LLC Engineers and Scientists</p>		<p>Tradepoint Atlantic</p>
		<p>Sparrows Point</p>
		<p>Baltimore County, MD</p>
<p>ARM Project 21010204</p>		



- ◆ Soil Boring
- Proposed Site Boundary
- External Construction Area
- Parcel Boundary

Sub-Parcel B4-2 Phase II Soil Sample Locations August 2, 2021		Figure 3
 ARM Group LLC <small>Engineers and Scientists</small>		Tradepoint Atlantic Sparrows Point Baltimore County, MD ARM Project 21010204



B4-033-SB-1

B4-032-SB-1

B18-028-SB-1.5
B18-028-SB-7

B4-016-SB-1
B4-016-SB-5
Naphthalene: 32.8

B18-069-SB-1
B18-069-SB-8

B4-017-SB-1
B4-017-SB-4
Benzo[a]pyrene: 4.7

B18-033-SB-1

B18-034-SB-1
B18-034-SB-5

B18-015-SB-1

B18-016-SB-1

B18-013-SB-1
B18-013-SB-4

B18-019-SB-8
B18-019-SB-11

B18-014-SB-1
B18-014-SB-5

B18-023-SB-1
B18-023-SB-6

B18-024-SB-1
B18-024-SB-4

B18-073-SB-1
B18-073-SB-5

B18-006-SB-1

B18-005-SB-1

B18-004-SB-1

B18-076-SB-1

B18-075-SB-2
Benzo[a]pyrene: 2.3
B18-075-SB-5.5
Benzo[a]pyrene: 7.1

B18-075-SB-10
Benz[a]anthracene: 101
Benzo[a]pyrene: 78.9
Benzo[b]fluoranthene: 150
Dibenz[a,h]anthracene: 12.4
Indeno[1,2,3-c,d]pyrene: 43.2

B4-029-SB-1

B4-028-SB-1
B4-028-SB-4

B18-020-SB-11
B18-020-SB-14

B18-067-SB-1
B18-067-SB-4

B18-066-SB-1
B18-066-SB-4

B18-052-SB-1

B18-051-SB-1

B18-055-SB-1
B18-055-SB-5
B18-055-SB-10

B18-021-SB-1
B18-021-SB-4
Benzo[a]pyrene: 9.9

B18-053-SB-1
B18-053-SB-5

B18-054-SB-1
B18-054-SB-5

B18-056-SB-1

B18-035-SB-1
B18-035-SB-4

B18-036-SB-1
B18-036-SB-5

B18-011-SB-1
B18-011-SB-4
Benz[a]anthracene: 135
Benzo[a]pyrene: 126
Benzo[b]fluoranthene: 135
Dibenz[a,h]anthracene: 5.7
Indeno[1,2,3-c,d]pyrene: 49.0
Naphthalene: 140

B18-003-SB-1

B18-002-SB-1

B18-074-SB-1

B18-074-SB-9
Benzo[a]pyrene: 11.3
Dibenz[a,h]anthracene: 2.3

B18-070-SB-1
B18-070-SB-5

B18-071-SB-1
B18-071-SB-5

B18-072-SB-1
B18-072-SB-4

B5-177-SB-1
B5-177-SB-3.5
Benzo[a]pyrene: 10.4
Benzo[b]fluoranthene: 21.5
Dibenz[a,h]anthracene: 2.4

B5-062-SB-1

B5-063-SB-1
B5-063-SB-4

B18-001-SB-1
Benz[a]anthracene: 21.3
Benzo[a]pyrene: 11.6
Benzo[b]fluoranthene: 37.9
Dibenz[a,h]anthracene: 3.6

B18-001-SB-4

- Soil Boring
- Proposed Site Boundary
- External Construction Area
- Parcel Boundary

Sub-Parcel B4-2
Soil SVOC PAL Exceedances (mg/kg)
August 3, 2021

Figure 4

ARM Group LLC
Engineers and Scientists

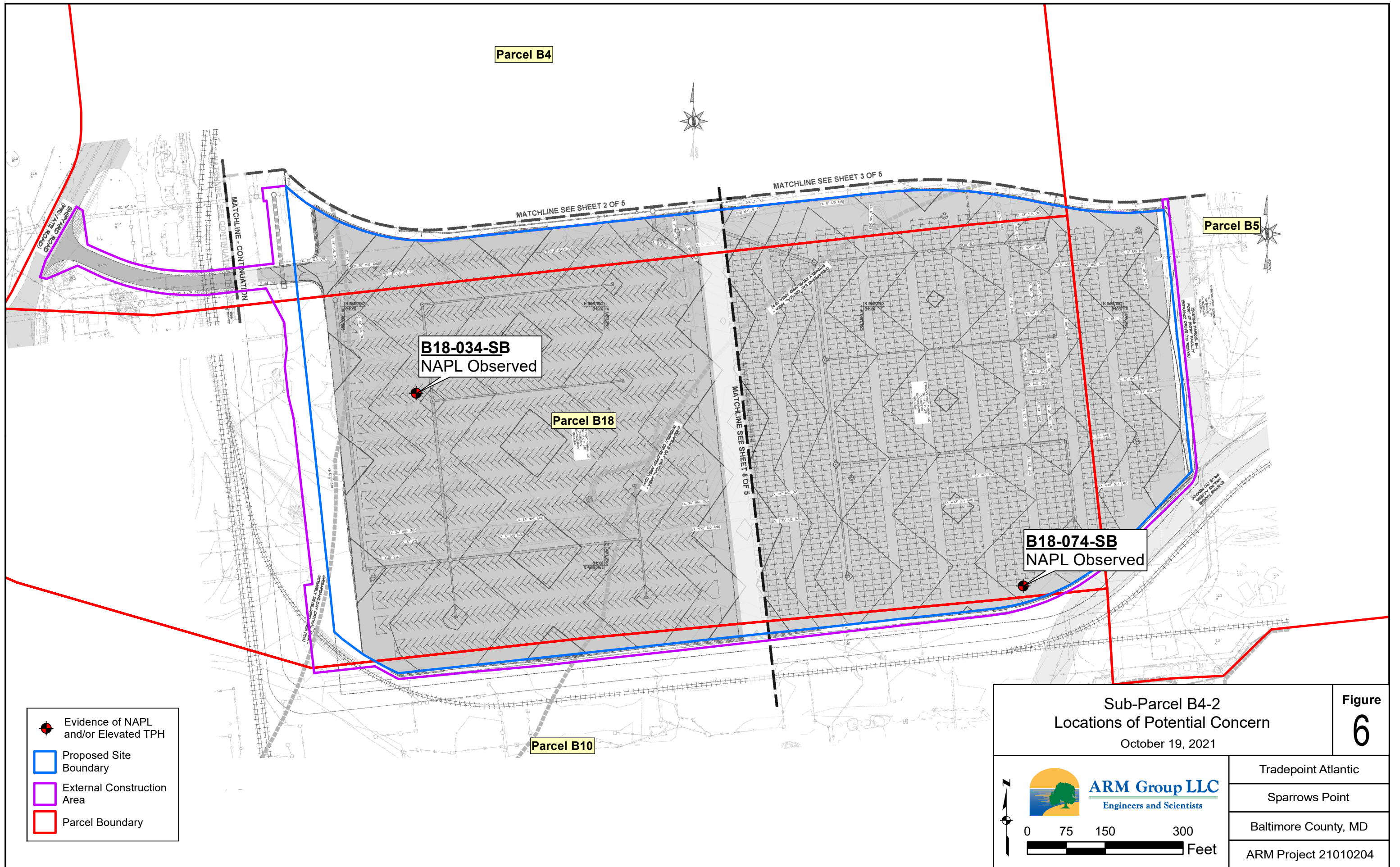
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Tradepoint Atlantic
Sparrows Point
Baltimore County, MD
ARM Project 21021204



- ◆ Soil Boring
- Proposed Site Boundary
- External Construction Area
- Parcel Boundary

Sub-Parcel B4-2 Soil Inorganic PAL Exceedances (mg/kg) August 3, 2021		Figure 5
ARM Group LLC Engineers and Scientists		Tradepoint Atlantic Sparrows Point Baltimore County, MD ARM Project 21020204



Sub-Parcel B4-2
Locations of Potential Concern
October 19, 2021

Figure 6

TABLES

**Table 1 - Sub-Parcel B4-2 Expansion
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
1,1-Biphenyl	92-52-4	B18-075-SB-2	0.24		0.018	0.06	79	27.85	410	20	no
1,2,4,5-Tetrachlorobenzene	95-94-3	B18-019-SB-8	0.11		0.11	0.11	79	1.27		35	no
2,4-Dimethylphenol	105-67-9	B18-011-SB-4	1.4		0.015	0.39	53	7.55		1,600	no
2,4-Dinitrotoluene	121-14-2	B18-013-SB-1	0.081		0.081	0.08	79	1.27	7.4	160	no
2,6-Dinitrotoluene	606-20-2	B18-001-SB-1	0.044	J	0.044	0.04	79	1.27	1.5	25	no
2-Butanone (MEK)	78-93-3	B4-029-SB-1	0.025		0.0049	0.01	27	22.22		19,000	no
2-Chloronaphthalene	91-58-7	B18-019-SB-8	0.14		0.14	0.14	79	1.27		6,000	no
2-Hexanone	591-78-6	B4-029-SB-1	0.0022	J	0.0022	0.002	27	3.70		130	no
2-Methylnaphthalene	91-57-6	B18-011-SB-4	49		0.0025	0.82	79	89.87		300	no
2-Methylphenol	95-48-7	B18-011-SB-4	1.5		0.018	0.41	52	7.69		4,100	no
3,3'-Dichlorobenzidine	91-94-1	B18-072-SB-4	0.15		0.15	0.15	79	1.27	5.1		no
4-Chloroaniline	106-47-8	B18-019-SB-8	0.024	J	0.024	0.02	79	1.27	11	330	no
Acenaphthene	83-32-9	B18-011-SB-4	13.1		0.00048	0.29	79	82.28		4,500	no
Acenaphthylene	208-96-8	B18-011-SB-4	125		0.0006	2.25	79	81.01			no
Acetone	67-64-1	B5-062-SB-1	0.14		0.011	0.05	27	29.63		67,000	no
Acetophenone	98-86-2	B18-001-SB-1	0.31		0.018	0.06	79	17.72		12,000	no
Aluminum	7429-90-5	B18-067-SB-1	86,900		4,580	16,069	79	100.00		110,000	no
Anthracene	120-12-7	B18-011-SB-4	155		0.0013	3.07	79	92.41		23,000	no
Antimony	7440-36-0	B18-028-SB-1.5	4.9	J	1.1	2.67	79	3.80		47	no
Aroclor 1254	11097-69-1	B4-033-SB-1	0.456		0.0298	0.21	48	14.58	0.97	1.5	no
Aroclor 1260	11096-82-5	B18-034-SB-1	0.0532	J	0.0496	0.05	48	4.17	0.99		no
Arsenic	7440-38-2	B4-016-SB-5	36.1		2	8.78	80	51.25	3	48	YES (C)
Barium	7440-39-3	B18-028-SB-7	1,550		21.9	170	79	100.00		22,000	no
Benz[a]anthracene	56-55-3	B18-011-SB-4	135		0.00098	4.39	79	93.67	21		YES (C)
Benzaldehyde	100-52-7	B5-177-SB-3.5	0.18	J	0.018	0.05	74	25.68	820	12,000	no
Benzene	71-43-2	B4-032-SB-1	0.021		0.0016	0.009	27	11.11	5.1	42	no
Benzo[a]pyrene	50-32-8	B18-011-SB-4	126		0.002	3.80	80	92.50	2.1	22	YES (C/NC)
Benzo[b]fluoranthene	205-99-2	B18-075-SB-10	150		0.0014	5.72	79	96.20	21		YES (C)
Benzo[g,h,i]perylene	191-24-2	B18-011-SB-4	45.3		0.0011	1.79	79	93.67			no
Benzo[k]fluoranthene	207-08-9	B18-075-SB-10	143		0.0013	3.68	79	96.20	210		no
Beryllium	7440-41-7	B18-028-SB-7	7.1		0.16	1.38	79	46.84	6,900	230	no
bis(2-Chloroethyl)ether	111-44-4	B18-020-SB-14	0.085		0.085	0.09	79	1.27	1		no
bis(2-Ethylhexyl)phthalate	117-81-7	B5-177-SB-3.5	0.38	J	0.015	0.09	79	12.66	160	1,600	no
Cadmium	7440-43-9	B18-072-SB-4	22		0.28	2.68	79	70.89	9,300	98	no
Caprolactam	105-60-2	B4-029-SB-1	0.087	J	0.022	0.05	79	12.66		40,000	no
Carbazole	86-74-8	B18-011-SB-4	76.7		0.018	2.82	79	37.97			no
Chromium	7440-47-3	B4-029-SB-1	1,400		4.3	671	79	98.73		180,000	no
Chromium VI	18540-29-9	B18-004-SB-1	42.5		0.18	4.88	78	25.64	6.3	350	YES (C)
Chrysene	218-01-9	B18-075-SB-10	93.4		0.0009	2.48	79	94.94	2,100		no
Cobalt	7440-48-4	B18-028-SB-1.5	45.9		0.29	8.59	79	65.82	1,900	35	YES (NC)
Copper	7440-50-8	B18-028-SB-1.5	1,280		4.3	87.9	79	100.00		4,700	no
Cyanide	57-12-5	B4-029-SB-1	87.2	J+	0.063	3.82	79	94.94		120	no

**Table 1 - Sub-Parcel B4-2 Expansion
COPC Screening Analysis**

Parameter	CAS#	Location of Max Result	Max Detection (mg/kg)	Final Flag	Min Detection (mg/kg)	Average Detection (mg/kg)	Total Samples	Frequency of Detection (%)	Cancer TR=1E-06 (mg/kg)	Non-Cancer HQ=0.1 (mg/kg)	COPC?
Cyclohexane	110-82-7	B18-019-SB-8	0.0054	J	0.0054	0.005	27	3.70		2,700	no
Dibenz[a,h]anthracene	53-70-3	B18-075-SB-10	12.4		0.0016	0.51	79	84.81	2.1		YES (C)
Di-n-butylphthalate	84-74-2	B18-011-SB-4	2.1		0.026	0.57	79	5.06		8,200	no
Di-n-octylphthalate	117-84-0	B18-075-SB-10	0.12		0.027	0.07	79	5.06		820	no
Ethylbenzene	100-41-4	B4-016-SB-5	0.0023	J	0.0023	0.002	27	3.70	25	2,000	no
Fluoranthene	206-44-0	B18-075-SB-10	526		0.00081	13.7	79	97.47		3,000	no
Fluorene	86-73-7	B18-011-SB-4	147		0.00074	2.92	79	73.42		3,000	no
Hexachloroethane	67-72-1	B18-019-SB-8	0.031	J	0.031	0.03	79	1.27	8	46	no
Indeno[1,2,3-c,d]pyrene	193-39-5	B18-011-SB-4	49		0.0018	1.92	79	91.14	21		YES (C)
Iron	7439-89-6	B18-013-SB-4	459,000		1,740	148,265	79	100.00		82,000	YES (NC)
Isophorone	78-59-1	B18-072-SB-4	0.056	J	0.056	0.06	79	1.27	2,400	16,000	no
Lead^	7439-92-1	B18-066-SB-4	3,850	J	2.8	233	80	96.25		800	YES (NC)
Manganese	7439-96-5	B18-024-SB-1	36,600		177	16,344	79	100.00		2,600	YES (NC)
Mercury	7439-97-6	B18-001-SB-1	28.1		0.0027	1.31	79	77.22		35	no
Naphthalene	91-20-3	B18-011-SB-4	140		0.0021	2.78	79	88.61	8.6	59	YES (C/NC)
Nickel	7440-02-0	B18-006-SB-1	265		2.4	40.9	79	97.47	64,000	2,200	no
N-Nitrosodiphenylamine	86-30-6	B18-075-SB-10	0.13		0.017	0.05	79	5.06	470		no
PCBs (total)*	1336-36-3	B4-033-SB-1	0.456		0.0298	0.20	48	16.67	0.94		no
Pentachlorophenol	87-86-5	B18-075-SB-10	0.053	J	0.031	0.04	52	3.85	4	280	no
Phenanthrene	85-01-8	B18-011-SB-4	498		0.00085	9.13	79	98.73			no
Phenol	108-95-2	B18-011-SB-4	5		0.017	0.67	52	15.38		25,000	no
Pyrene	129-00-0	B18-075-SB-10	364		0.00067	10.2	79	96.20		2,300	no
Selenium	7782-49-2	B18-069-SB-8	7.6		1.4	4.04	79	6.33		580	no
Silver	7440-22-4	B18-072-SB-4	9.3		0.54	2.34	79	67.09		580	no
Styrene	100-42-5	B4-017-SB-4	0.0031	J	0.0031	0.003	27	3.70		3,500	no
Thallium	7440-28-0	B18-034-SB-1	17.7		3.7	8.44	79	51.90		1.2	YES (NC)
Toluene	108-88-3	B4-017-SB-4	0.011		0.0032	0.008	27	33.33		4,700	no
Toluene	108-88-3	B4-016-SB-5	0.011		0.0032	0.008	27	33.33		4,700	no
Vanadium	7440-62-2	B4-016-SB-1	938		10.3	412	79	100.00		580	YES (NC)
Xylenes	1330-20-7	B4-016-SB-5	0.0038	J	0.003	0.003	27	11.11		250	no
Zinc	7440-66-6	B18-072-SB-4	27,800		34.7	1,583	79	97.47		35,000	no

J: The positive result reported for this analyte is a quantitative estimate.

J+: The positive result reported for this analyte is a quantitative estimate but may be biased high.

COPC = Constituent of Potential Concern

C = Compound was identified as a cancer COPC

TR = Target Risk

NC = Compound was identified as a non-cancer COPC

HQ = Hazard Quotient

*PCBs (total) include the sum of all detected aroclor mixtures, including those without regional screening levels (e.g. Aroclor 1262, Aroclor 1268) which are not displayed.

^The COPC screening level for lead was not adjusted to the HQ=0.1 because lead is not assessed in the SLRA. The 800 mg/kg PAL is relevant to the Adult Lead Model procedure.

**Table 2 - Sub-Parcel B4-2 Expansion
Assessment of Lead**

Exposure Unit	Surface/Sub-Surface	Maximum Concentration (mg/kg)	Arithmetic Mean (mg/kg)
EU1 (32.5 ac.)	Surface	684	89.6
	Sub-Surface	3,850	424
	Pooled	3,850	224
EU1-EXP (35.4 ac.)	Surface	702	103
	Sub-Surface	3,850	406
	Pooled	3,850	224

**Table 3 - Sub-Parcel B4-2 Expansion
Soil Exposure Point Concentrations**

Parameter	Site-Wide EU1 (32.5 ac.)					
	EPCs - Surface Soils		EPCs - Sub-Surface Soils		EPCs - Pooled Soils	
	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Arsenic	95% KM Adjusted Gamma UCL	4.38	95% KM (t) UCL	9.09	95% KM Approximate Gamma UCL	6.01
Chromium VI	KM H-UCL	2.50	Maximum Value	2.80	KM H-UCL	1.09
Cobalt	Gamma Adjusted KM-UCL	5.95	95% GROS Adjusted Gamma UCL	12.1	95% GROS Approximate Gamma UCL	7.49
Iron	95% Student's-t UCL	180,190	95% Adjusted Gamma UCL	171,226	95% Student's-t UCL	166,086
Manganese	95% Chebyshev (Mean, Sd) UCL	26,887	95% Student's-t UCL	13,425	95% Chebyshev (Mean, Sd) UCL	21,942
Thallium	95% KM (t) UCL	8.54	95% KM (t) UCL	7.59	95% KM (t) UCL	7.93
Vanadium	95% Student's-t UCL	567	95% Student's-t UCL	370	95% Chebyshev (Mean, Sd) UCL	556
Benz[a]anthracene	95% KM (Chebyshev) UCL	2.81	99% KM (Chebyshev) UCL	68.8	95% KM (Chebyshev) UCL	14.8
Benzo[a]pyrene	95% KM (Chebyshev) UCL	1.58	99% KM (Chebyshev) UCL	58.5	95% KM (Chebyshev) UCL	12.7
Benzo[b]fluoranthene	95% KM (Chebyshev) UCL	4.98	99% KM (Chebyshev) UCL	82.9	95% KM (Chebyshev) UCL	18.4
Dibenz[a,h]anthracene	95% KM (Chebyshev) UCL	0.47	97.5% KM (Chebyshev) UCL	3.98	95% KM (Chebyshev) UCL	1.32
Indeno[1,2,3-c,d]pyrene	95% KM (Chebyshev) UCL	1.36	99% KM (Chebyshev) UCL	26.8	95% KM (Chebyshev) UCL	5.89
Naphthalene	95% KM (Chebyshev) UCL	0.42	97.5% KM (Chebyshev) UCL	36.7	KM H-UCL	1.13

Bold indicates maximum value used as the EPC

**Table 3 - Sub-Parcel B4-2 Expansion
Soil Exposure Point Concentrations**

Parameter	Site-Wide EU1-EXP (35.4 ac.)					
	EPCs - Surface Soils		EPCs - Sub-Surface Soils		EPCs - Pooled Soils	
	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)	EPC Type	EPC (mg/kg)
Arsenic	KM H-UCL	4.12	95% GROS Adjusted Gamma UCL	13.0	95% KM Approximate Gamma UCL	6.90
Chromium VI	KM H-UCL	2.63	Maximum Value	2.80	KM H-UCL	1.16
Cobalt	Gamma Adjusted KM-UCL	7.46	95% GROS Adjusted Gamma UCL	12.5	95% KM Approximate Gamma UCL	8.12
Iron	95% Student's-t UCL	183,467	95% Adjusted Gamma UCL	164,398	95% Student's-t UCL	164,323
Manganese	95% Chebyshev (Mean, Sd) UCL	26,182	95% Student's-t UCL	13,397	95% Chebyshev (Mean, Sd) UCL	21,472
Thallium	95% KM (t) UCL	8.50	95% KM (t) UCL	7.52	95% KM (t) UCL	7.89
Vanadium	95% Student's-t UCL	561	95% Student's-t UCL	345	95% Student's-t UCL	462
Benz[a]anthracene	95% KM (Chebyshev) UCL	2.69	99% KM (Chebyshev) UCL	62.4	95% KM (Chebyshev) UCL	13.4
Benzo[a]pyrene	95% KM (Chebyshev) UCL	1.96	97.5% KM (Chebyshev) UCL	36.4	95% KM (Chebyshev) UCL	11.6
Benzo[b]fluoranthene	95% KM (Chebyshev) UCL	4.88	99% KM (Chebyshev) UCL	75.3	95% KM (Chebyshev) UCL	16.8
Dibenz[a,h]anthracene	95% KM (Chebyshev) UCL	0.50	97.5% KM (Chebyshev) UCL	3.62	95% KM (Chebyshev) UCL	1.22
Indeno[1,2,3-c,d]pyrene	95% KM (Chebyshev) UCL	1.48	97.5% KM (Chebyshev) UCL	16.7	95% KM (Chebyshev) UCL	5.39
Naphthalene	95% KM (Chebyshev) UCL	0.40	97.5% KM (Chebyshev) UCL	34.7	KM H-UCL	1.90

Bold indicates maximum value used as the EPC

**Table 4 - Sub-Parcel B4-2 Expansion
Surface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Site-Wide EU1 (32.5 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	4.38	3.00	480	1.5E-06	0.009
Chromium VI	Respiratory	2.50	6.30	3500	4.0E-07	0.0007
Cobalt	Thyroid	5.95	1,900	350	3.1E-09	0.02
Iron	Gastrointestinal	180,190		820,000		0.2
Manganese	Nervous	26,887		26,000		1
Thallium	Dermal	8.54		12		0.7
Vanadium	Dermal	567		5,800		0.1
Benz[a]anthracene		2.81	21		1.3E-07	
Benzo[a]pyrene	Developmental	1.58	2.1	220	7.5E-07	0.007
Benzo[b]fluoranthene		4.98	21		2.4E-07	
Dibenz[a,h]anthracene		0.47	2.1		2.2E-07	
Indeno[1,2,3-c,d]pyrene		1.36	21		6.5E-08	
Naphthalene	Nervous; Respiratory	0.42	8.6	590	4.9E-08	0.0007
					3E-06	↓

RSLs were obtained from the EPA Regional Screening Levels at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Total HI	Cardiovascular	0
	Dermal	1
	Respiratory	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0

**Table 5 - Sub-Parcel B4-2 Expansion
Sub-Surface Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Site-Wide EU1 (32.5 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	9.09	3.00	480	3.0E-06	0.02
Chromium VI	Respiratory	2.80	6.30	3500	4.4E-07	0.0008
Cobalt	Thyroid	12.1	1,900	350	6.4E-09	0.03
Iron	Gastrointestinal	171,226		820,000		0.2
Manganese	Nervous	13,425		26,000		0.5
Thallium	Dermal	7.59		12		0.6
Vanadium	Dermal	370		5,800		0.06
Benz[a]anthracene		68.8	21		3.3E-06	
Benzo[a]pyrene	Developmental	58.5	2.1	220	2.8E-05	0.3
Benzo[b]fluoranthene		82.9	21		3.9E-06	
Dibenz[a,h]anthracene		3.98	2.1		1.9E-06	
Indeno[1,2,3-c,d]pyrene		26.8	21		1.3E-06	
Naphthalene	Nervous; Respiratory	36.7	8.6	590	4.3E-06	0.06
					5E-05	↓

RSLs were obtained from the EPA Regional Screening Levels at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search
Bold indicates maximum detection

Total HI	Cardiovascular	0
	Dermal	1
	Respiratory	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0

**Table 6 - Sub-Parcel B4-2 Expansion
Pooled Soils
Composite Worker Risk Ratios**

Parameter	Target Organs	Site-Wide EU1 (32.5 ac.)				
		EPC (mg/kg)	Composite Worker			
			RSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	6.01	3.00	480	2.0E-06	0.01
Chromium VI	Respiratory	1.09	6.30	3500	1.7E-07	0.0003
Cobalt	Thyroid	7.49	1,900	350	3.9E-09	0.02
Iron	Gastrointestinal	166,086		820,000		0.2
Manganese	Nervous	21,942		26,000		0.8
Thallium	Dermal	7.93		12		0.7
Vanadium	Dermal	556		5,800		0.1
Benz[a]anthracene		14.8	21		7.0E-07	
Benzo[a]pyrene	Developmental	12.7	2.1	220	6.0E-06	0.06
Benzo[b]fluoranthene		18.4	21		8.8E-07	
Dibenz[a,h]anthracene		1.32	2.1		6.3E-07	
Indeno[1,2,3-c,d]pyrene		5.89	21		2.8E-07	
Naphthalene	Nervous; Respiratory	1.13	8.6	590	1.3E-07	0.002
					1E-05	↓

RSLs were obtained from the EPA Regional Screening Levels at https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search

Total HI	Cardiovascular	0
	Dermal	1
	Respiratory	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0

**Table 7 - Sub-Parcel B4-2 Expansion
Surface Soils
Construction Worker Risk Ratios**

55 Day		Site-Wide EU1-EXP (35.4 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	6.89	68.8	438	1.0E-07	0.02
Chromium VI	Respiratory	4.58	97.9	3,640	4.7E-08	0.001
Cobalt	Thyroid	5.49	20,938	4,311	2.6E-10	0.001
Iron	Gastrointestinal	182,399		1,093,370		0.2
Manganese	Nervous	22,767		18,956		1
Thallium	Dermal	8.49		62.5		0.1
Vanadium	Dermal	1,110		7,268		0.2
Benz[a]anthracene		0.56	611		9.2E-10	
Benzo[a]pyrene	Developmental	1.78	76.3	21.3	2.3E-08	0.08
Benzo[b]fluoranthene		1.34	759		1.8E-09	
Dibenz[a,h]anthracene		0.46	81.0		5.7E-09	
Indeno[1,2,3-c,d]pyrene		1.34	787		1.7E-09	
Naphthalene	Nervous; Respiratory	0.38	42.4	65.7	9.0E-09	0.006
					2E-07	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumptions:

- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0

**Table 8 - Sub-Parcel B4-2 Expansion
Sub-Surface Soils
Construction Worker Risk Ratios**

55 Day		Site-Wide EU1-EXP (35.4 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	16.2	68.8	438	2.4E-07	0.04
Chromium VI	Respiratory	2.80	97.9	3,640	2.9E-08	0.0008
Cobalt	Thyroid	24.1	20,938	4,311	1.2E-09	0.006
Iron	Gastrointestinal	159,930		1,093,370		0.1
Manganese	Nervous	13,259		18,956		0.7
Thallium	Dermal	7.44		62.5		0.1
Vanadium	Dermal	347		7,268		0.05
Benz[a]anthracene		37.2	611		6.1E-08	
Benzo[a]pyrene	Developmental	31.9	76.3	21.3	4.2E-07	1
Benzo[b]fluoranthene		45.5	759		6.0E-08	
Dibenz[a,h]anthracene		3.17	81.0		3.9E-08	
Indeno[1,2,3-c,d]pyrene		14.6	787		1.9E-08	
Naphthalene	Nervous; Respiratory	30.3	42.4	65.7	7.1E-07	0.5
					2E-06	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumptions:

- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

Bold indicates maximum detection

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	1

**Table 9 - Sub-Parcel B4-2 Expansion
Pooled Soils
Construction Worker Risk Ratios**

55 Day		Site-Wide EU1-EXP (35.4 ac.)				
Parameter	Target Organs	EPC (mg/kg)	Construction Worker			
			SSLs (mg/kg)		Risk Ratios	
			Cancer	Non-Cancer	Risk	HQ
Arsenic	Cardiovascular; Dermal	10.3	68.8	438	1.5E-07	0.02
Chromium VI	Respiratory	2.87	97.9	3,640	2.9E-08	0.0008
Cobalt	Thyroid	12.1	20,938	4,311	5.8E-10	0.003
Iron	Gastrointestinal	163,250		1,093,370		0.1
Manganese	Nervous	21,157		18,956		1
Thallium	Dermal	7.85		62.5		0.1
Vanadium	Dermal	782		7,268		0.1
Benz[a]anthracene		12.1	611		2.0E-08	
Benzo[a]pyrene	Developmental	10.5	76.3	21.3	1.4E-07	0.5
Benzo[b]fluoranthene		15.3	759		2.0E-08	
Dibenz[a,h]anthracene		1.11	81.0		1.4E-08	
Indeno[1,2,3-c,d]pyrene		4.85	787		6.2E-09	
Naphthalene	Nervous; Respiratory	2.53	42.4	65.7	6.0E-08	0.04
					4E-07	↓

SSLs calculated using equations in the EPA Supplemental Guidance dated 2002
Guidance Equation Input Assumptions:

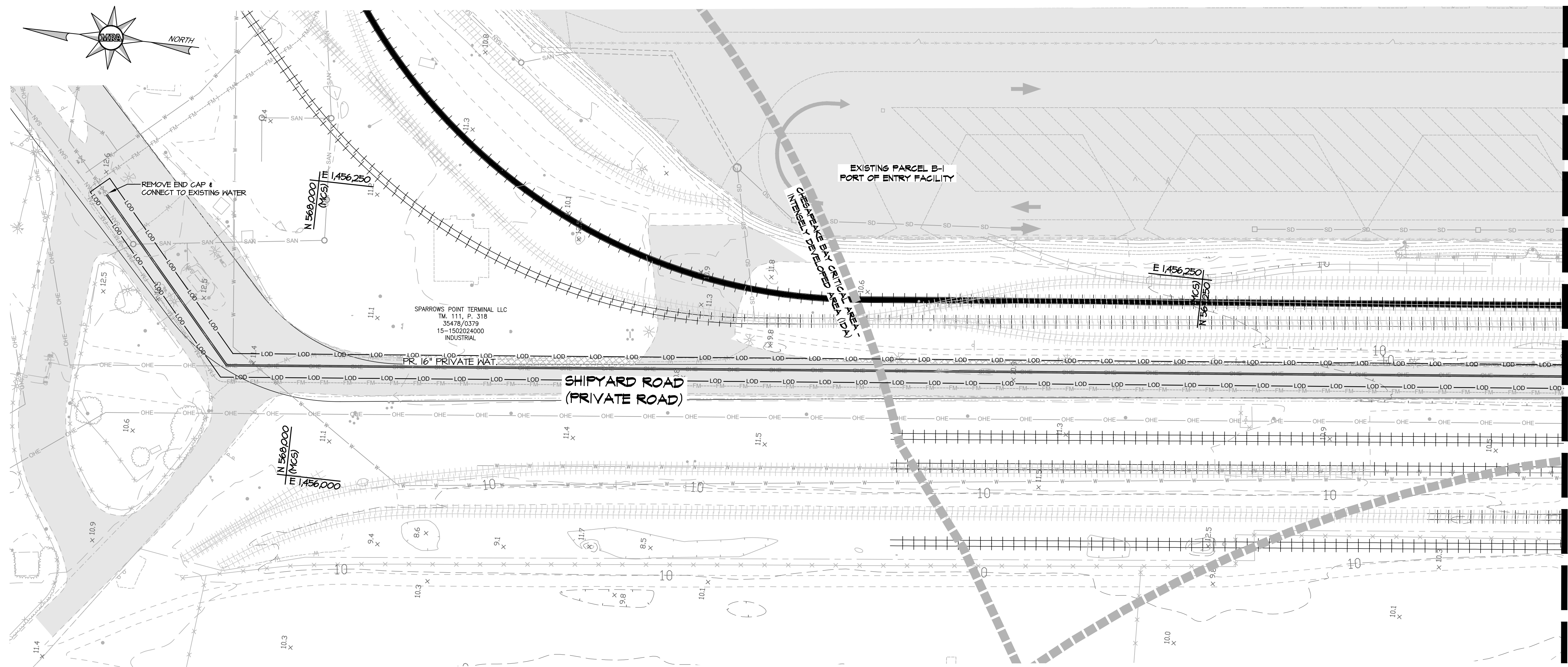
- 5 cars/day (2 tons/car)
- 5 trucks/day (20 tons/truck)
- 3 meter source depth thickness

Total HI	Cardiovascular	0
	Dermal	0
	Respiratory	0
	Thyroid	0
	Gastrointestinal	0
	Nervous	1
	Developmental	0

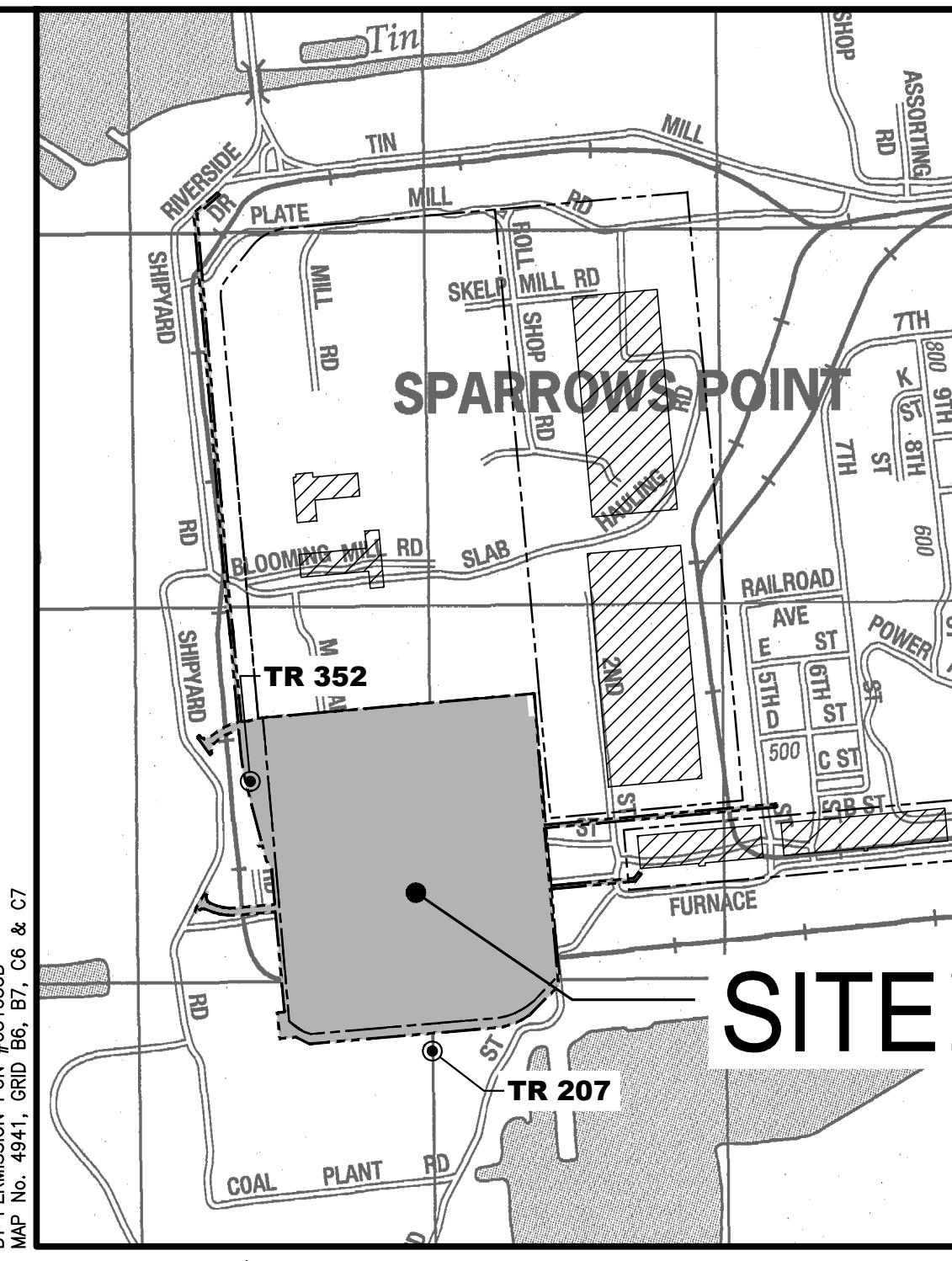
ATTACHMENT 1

LEGEND	
	EXISTING LINE
	EASEMENT LINE
	CL. OF ROAD
	EDGE OF PAVING
	CURB
	1' CONTOUR
	5' CONTOUR
	100-YEAR FLOODPLAIN
	STORM DRAIN
	WATER
	SANITARY SEWER
	TREE LINE
	FENCE
	EXISTING PAVEMENT
	PROPOSED EDGE OF PAVING
	PROPOSED CURB
	PROPOSED BUILDING SETBACK
	PROPOSED EASEMENT
	PROPOSED 1' CONTOUR
	PROPOSED 5' CONTOUR
	PROPOSED STORM DRAIN
	PROPOSED WATER
	PROPOSED SANITARY SEWER
	PROPOSED SANITARY FORCE MAIN
	LIMIT OF CLEARING
	LIMIT OF DISTURBANCE
	PROPOSED PAVEMENT

NOTE:
NO BASEMENTS ARE BEING PROPOSED AS PART OF THIS PLAN. ALL BUILDINGS SHALL CONSIST OF SLAB ON GRADE CONSTRUCTION.



MATCHLINE - SEE CONTINUATION THIS SHEET



VICINITY MAP
SCALE: 1" = 1000'

BENCHMARKS

TR 207 - PIN & CAP ELEV. 11.33 SOUTH END OF SITE	N 562,853.49 E 1,457,617.16
TR 352 - PIN & CAP ELEV. 14.55 EAST SIDE RR	N 564,549.33 E 1,456,457.83

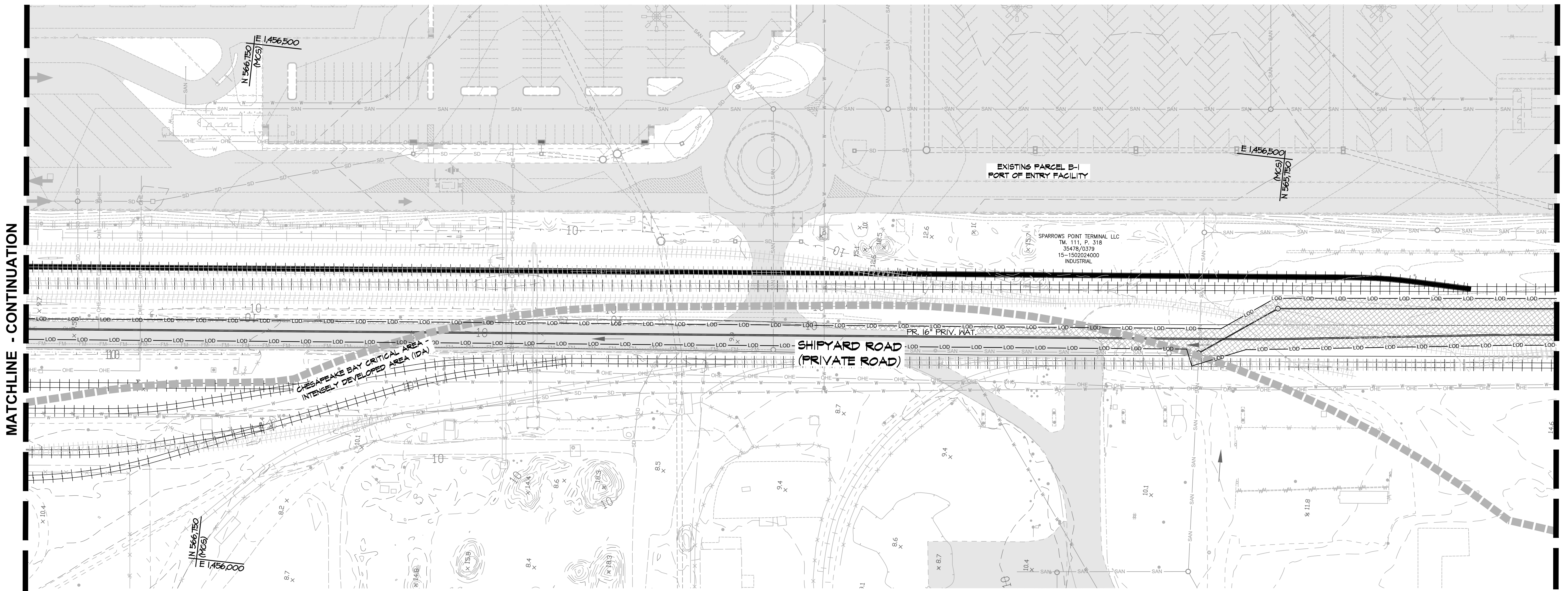
SITE ANALYSIS

TOTAL AREA OF SITE (PARCEL AREAS):	71.23 AC
AREA WITHIN LIMITS OF DISTURBANCE SHOWN:	2,901,000 S.F. / 66.60 AC
AREA TO BE VEGETATIVELY STABILIZED:	402,834 S.F. / 9.25 AC
AREA TO BE IMPERVIOUS (BLDGS & PAVED AREAS):	2,498,166 S.F. / 57.35 AC
ESTIMATED TOTAL CUT:	61,310 CY
ESTIMATED TOTAL FILL:	86,610 CY
TOPSOIL:	N/A

* THE EARTHWORK QUANTITIES SHOWN HEREON ARE FOR INFORMATION PURPOSES ONLY. MRA MAKES NO GUARANTEES OF ACCURACY OF QUANTITIES OR BALANCE OF SITE. THE DEVELOPER AND CONTRACTOR SHALL TAKE FULL RESPONSIBILITY OF ACTUAL EARTHWORK QUANTITIES ENCOUNTERED DURING CONSTRUCTION. *

SITE DATA

TOTAL ONSITE AREA:	71.23 AC
ONSITE DISTURBED AREA (LOD):	66.60 AC
ONSITE EXISTING IMPERVIOUS AREA:	64.70 AC
ONSITE PROPOSED IMPERVIOUS AREA:	57.35 AC
WATERSHED:	BEAR CREEK/PATAPSCO RIVER (PATAPSCO RIVER AREA SUB-BASIN 02-13-09)



MATCHLINE - CONTINUATION

MATCHLINE SEE SHEET 2 OF 5

GRADING PERMIT #B975456
L.O.D. = 2,901,000 S.F. (66.60 AC.)

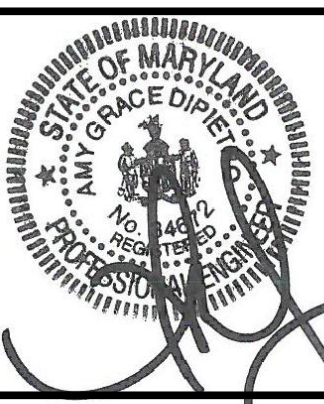
DESIGN & DRAWING BASED ON MARYLAND COORDINATE SYSTEM (MCS): HORIZONTAL NAD 83 (1991) VERTICAL NAVD 88

DATE	REVISIONS

OWNER/DEVELOPER

TRADEPOINT ATLANTIC

1600 SPARROWS POINT BOULEVARD
BALTIMORE, MARYLAND 21219
PHONE: (443) 452-1509
ATTN: MR. PETE HAID



PROFESSIONAL CERTIFICATION:
I (TAMMY G. DIPIETRO) HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 34622, EXPIRATION DATE: 8.23.2021.



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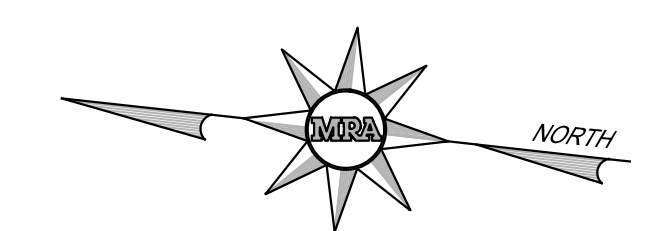
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ABINGDON, MARYLAND 21009
PHONE (410) 515-9000
FAX (410) 515-9002

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RORO PHASE 2 - IMPORT FACILITY AND PROCESSING CENTER
MDE DEVELOPMENT PLAN

FOR
TPA - RORO PHASE 2
1300 & 1301 SHIPYARD ROAD
SPARROWS POINT, MARYLAND

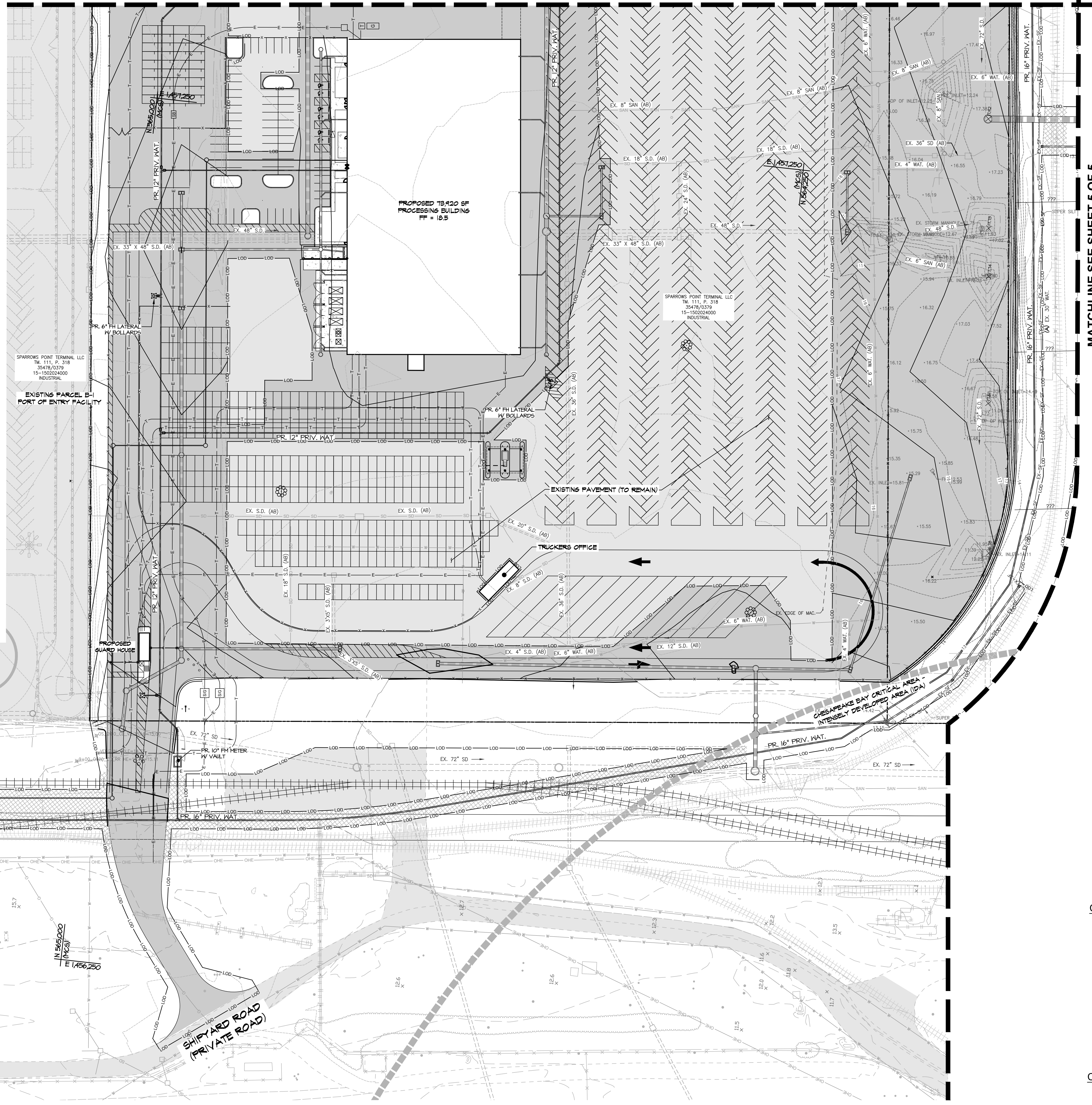
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SCALE:	1" = 50'
DATE:	7/1/2021
DRAWN BY:	CEM
DESIGN BY:	CEM
REVIEW BY:	AGD
SHEET:	01 OF 05



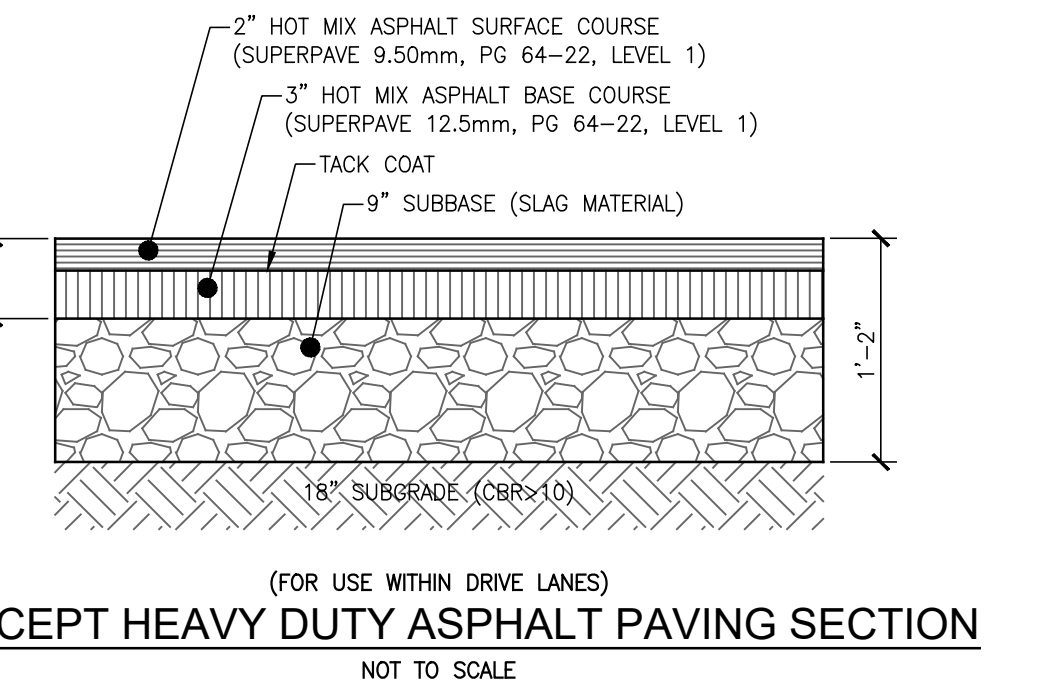
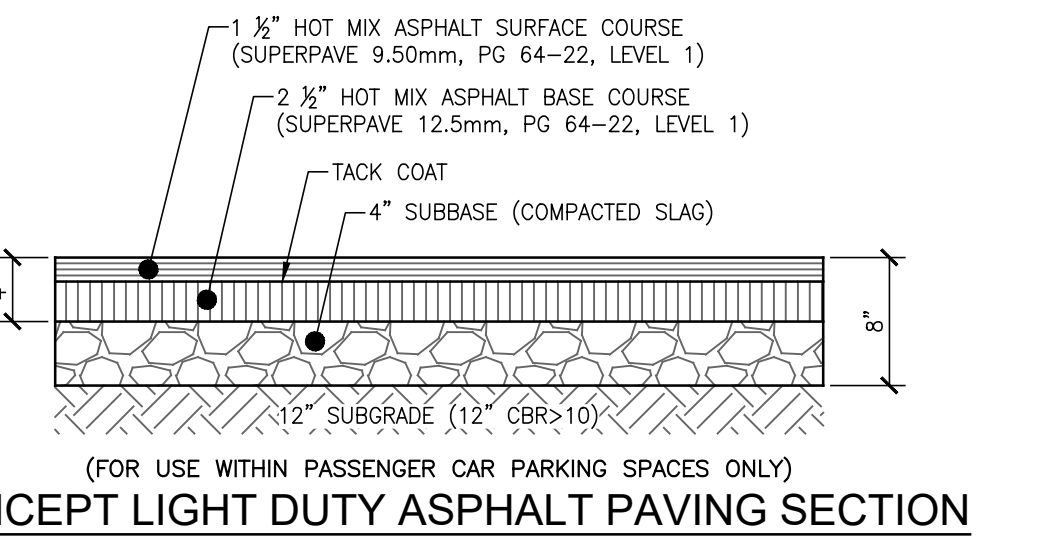
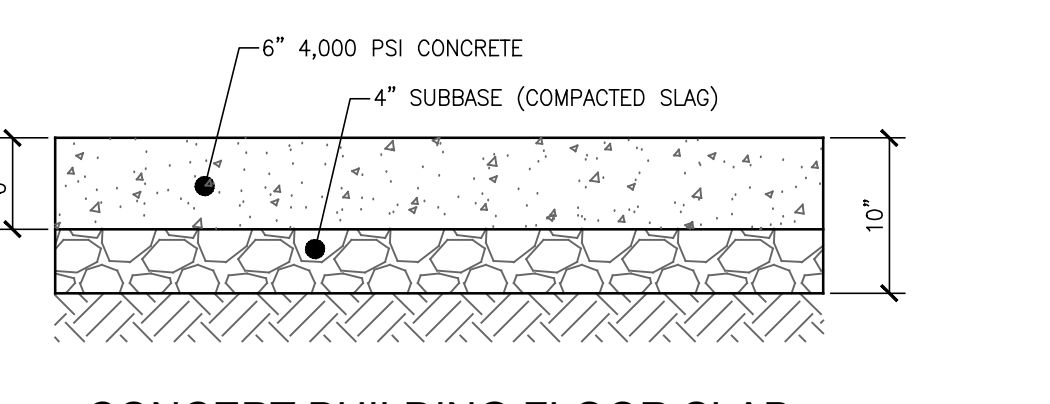
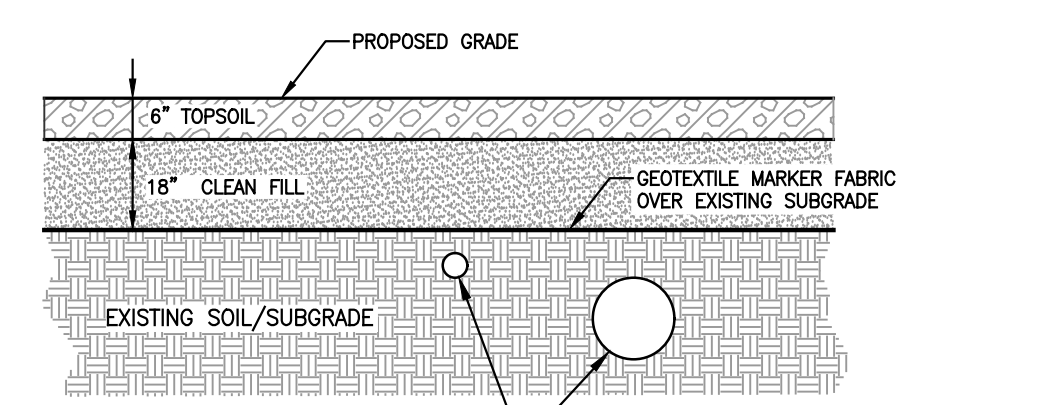
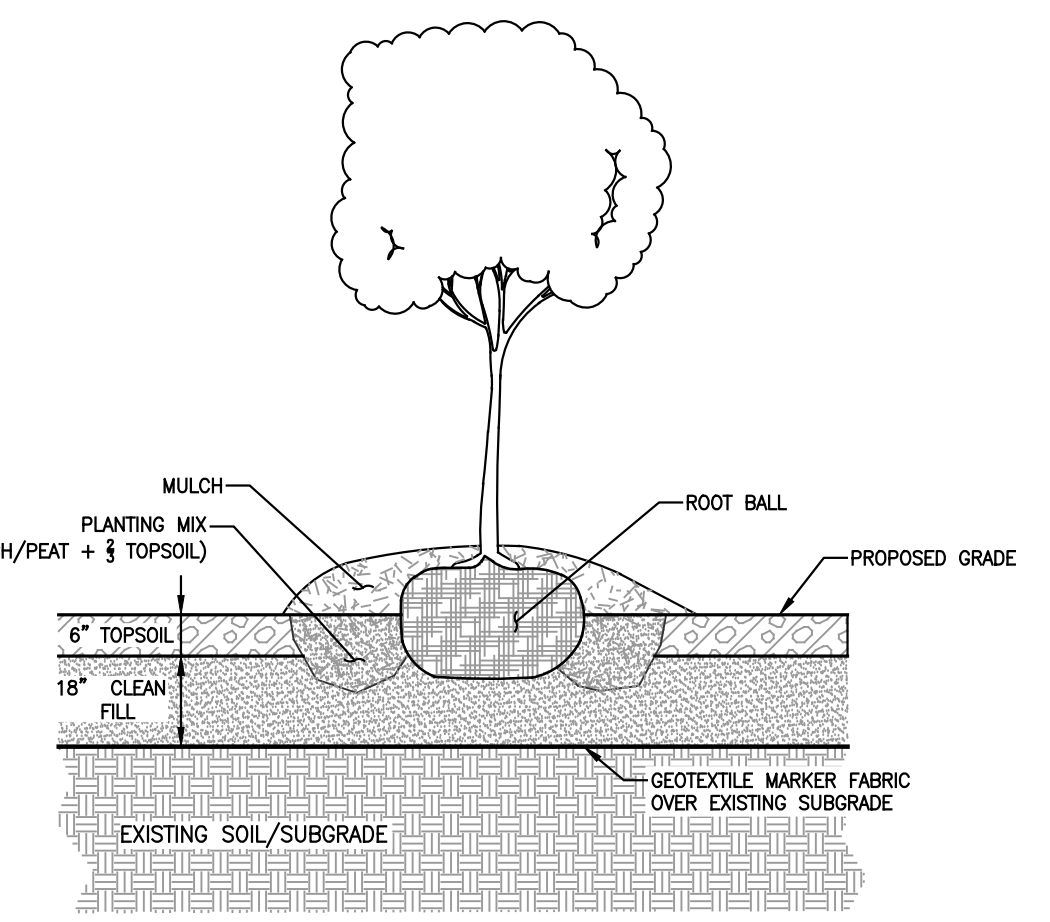
LEGEND

	EXISTING EASEMENT LINE
	EXISTING LEASE LINE
	EXISTING CL. OF ROAD
	EXISTING EDGE OF PAVING
	EXISTING CURB
	1' CONTOURS
	5' CONTOURS
	100-YEAR FLOODPLAIN
	STORM DRAIN
	WATER
	SANITARY SEWER
	TREE LINE
	FENCE
	EXISTING PAVEMENT
	PROPOSED EDGE OF PAVING
	PROPOSED CURB
	PROPOSED BUILDING SETBACK
	PROPOSED EASEMENT
	1' CONTOUR
	5' CONTOUR
	STORM DRAIN
	WATER
	SANITARY SEWER
	SANITARY FORCE MAIN
	LIMIT OF CLEARING
	LIMIT OF DISTURBANCE
	PROPOSED PAVEMENT

NOTE:
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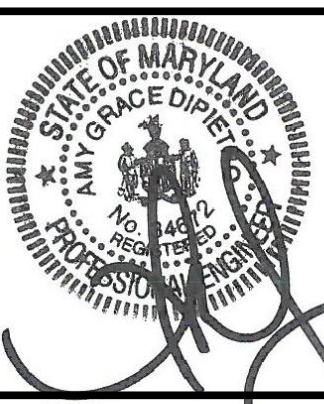
MATCHLINE SEE SHEET 5 OF 5



MATCHLINE SEE SHEET 1 OF 5

DATE	REVISIONS

OWNER/DEVELOPER
TRADEPOINT ATLANTIC
1600 SPARROWS POINT BOULEVARD
BALTIMORE, MARYLAND 21219
PHONE: (443) 452-1509
ATTN: MR. PETE HAID



PROFESSIONAL CERTIFICATION:
I (TAMM G. DIPIETRO) HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 34622, EXPIRATION DATE: 8.23.2021.

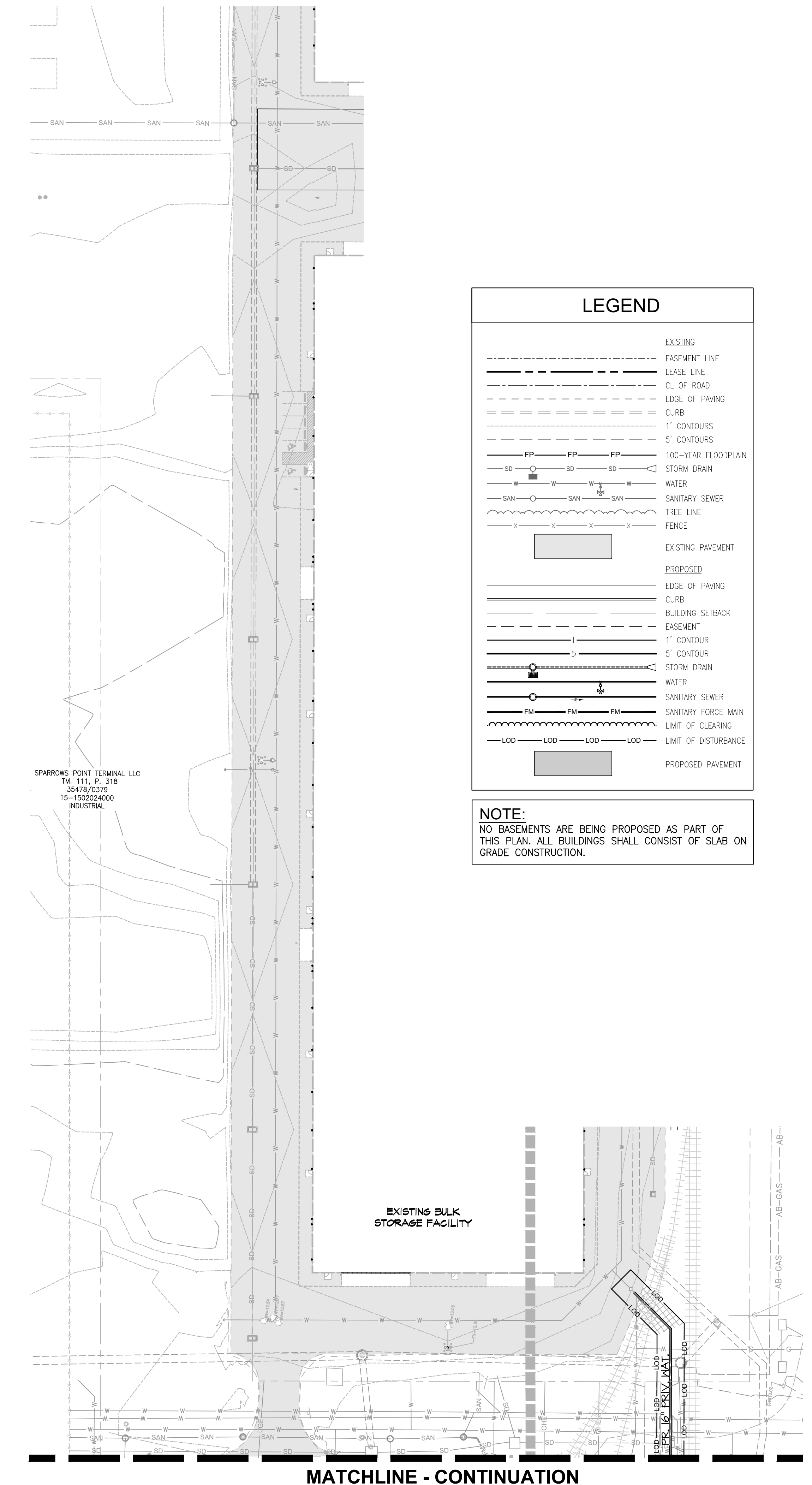
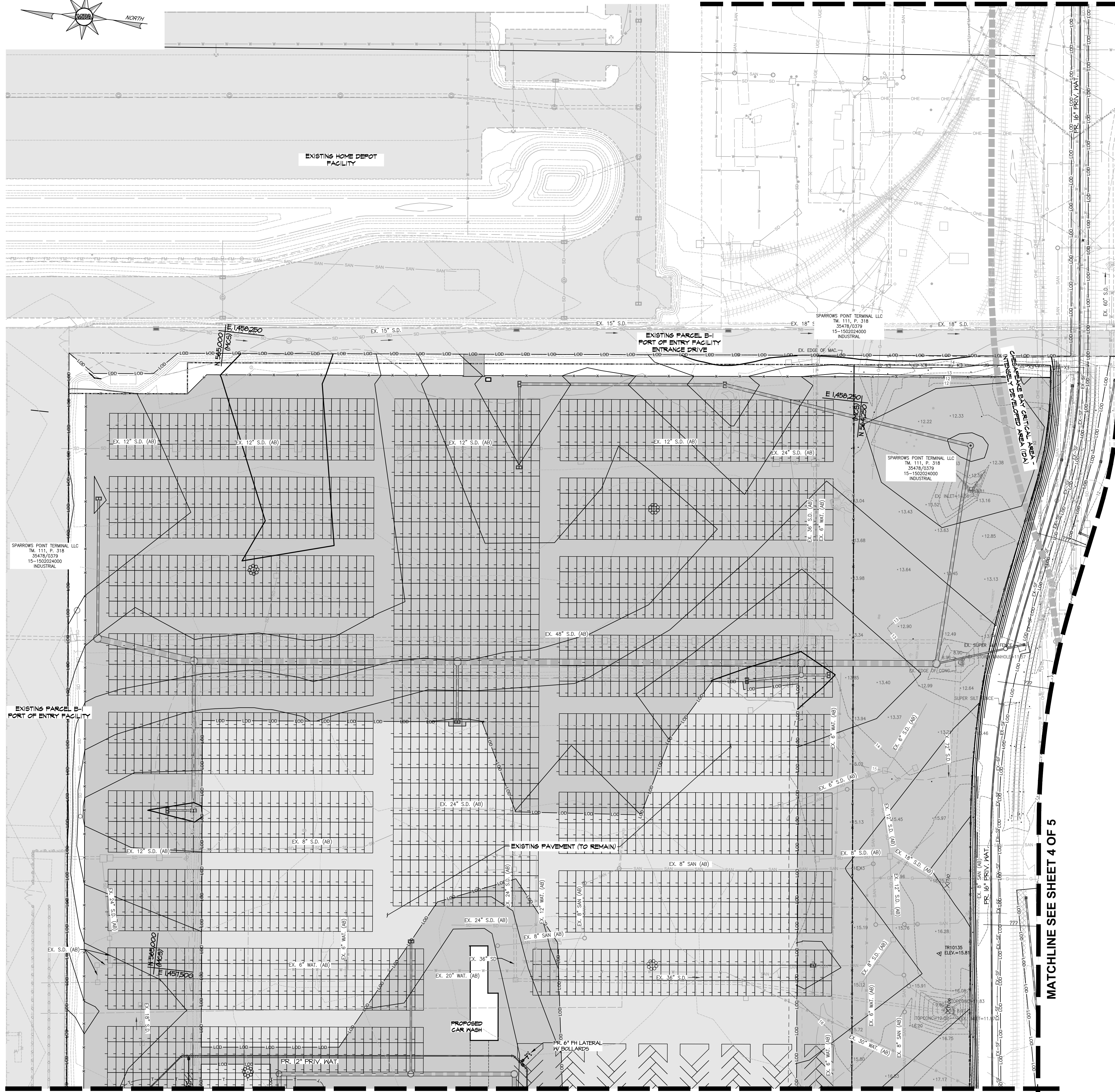
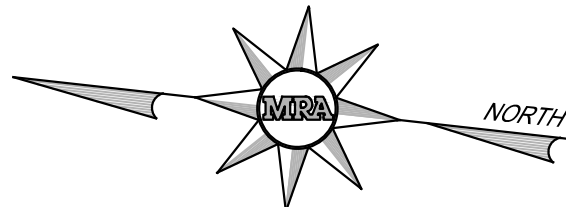


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RORO PHASE 2 - IMPORT FACILITY AND PROCESSING CENTER
MDE DEVELOPMENT PLAN
FOR
TPA - RORO PHASE 2
1300 & 1301 SHIPYARD ROAD
SPARROWS POINT, MARYLAND

DESIGN & DRAWING BASED ON MARYLAND COORDINATE SYSTEM (MCS): HORIZONTAL NAD 83 (1991) VERTICAL NAVD 88
JOB NO: 20519
SCALE: 1" = 50'
DATE: 7/1/2021
DRAWN BY: CEM
DESIGN BY: CEM
REVIEW BY: AGD
SHEET: 02 OF 05

MATCHLINE - SEE CONTINUATION THIS SHEET



LEGEND	
	EXISTING EASEMENT LINE
	EXISTING LEASE LINE
	EXISTING CL. OF ROAD
	EXISTING EDGE OF PAVING
	EXISTING CURB
	1' CONTOURS
	5' CONTOURS
	100-YEAR FLOODPLAIN
	STORM DRAIN
	WATER
	SANITARY SEWER
	TREE LINE
	FENCE
	EXISTING PAVEMENT
	PROPOSED EDGE OF PAVING
	PROPOSED CURB
	PROPOSED BUILDING SETBACK
	PROPOSED EASEMENT
	1' PROPOSED CONTOUR
	5' PROPOSED CONTOUR
	PROPOSED STORM DRAIN
	PROPOSED WATER
	PROPOSED SANITARY SEWER
	PROPOSED SANITARY FORCE MAIN
	LIMIT OF CLEARING
	LIMIT OF DISTURBANCE
	PROPOSED PAVEMENT

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MATCHLINE SEE SHEET 2 OF 5

MATCHLINE SEE SHEET 4 OF 5

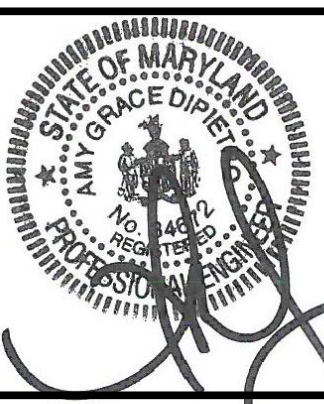
MATCHLINE - CONTINUATION

SCALE: 1"=50'

DESIGN & DRAWING BASED ON MARYLAND COORDINATE SYSTEM (MCS): HORIZONTAL NAD 83 (1991) VERTICAL NAVD 88

DATE	REVISIONS

OWNER/DEVELOPER
TRADEPOINT ATLANTIC
1600 SPARROWS POINT BOULEVARD
BALTIMORE, MARYLAND 21219
PHONE: (443) 452-1509
ATTN: MR. PETE HAID



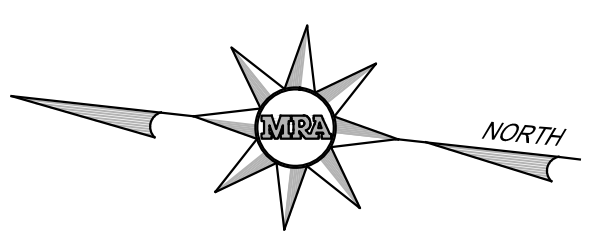
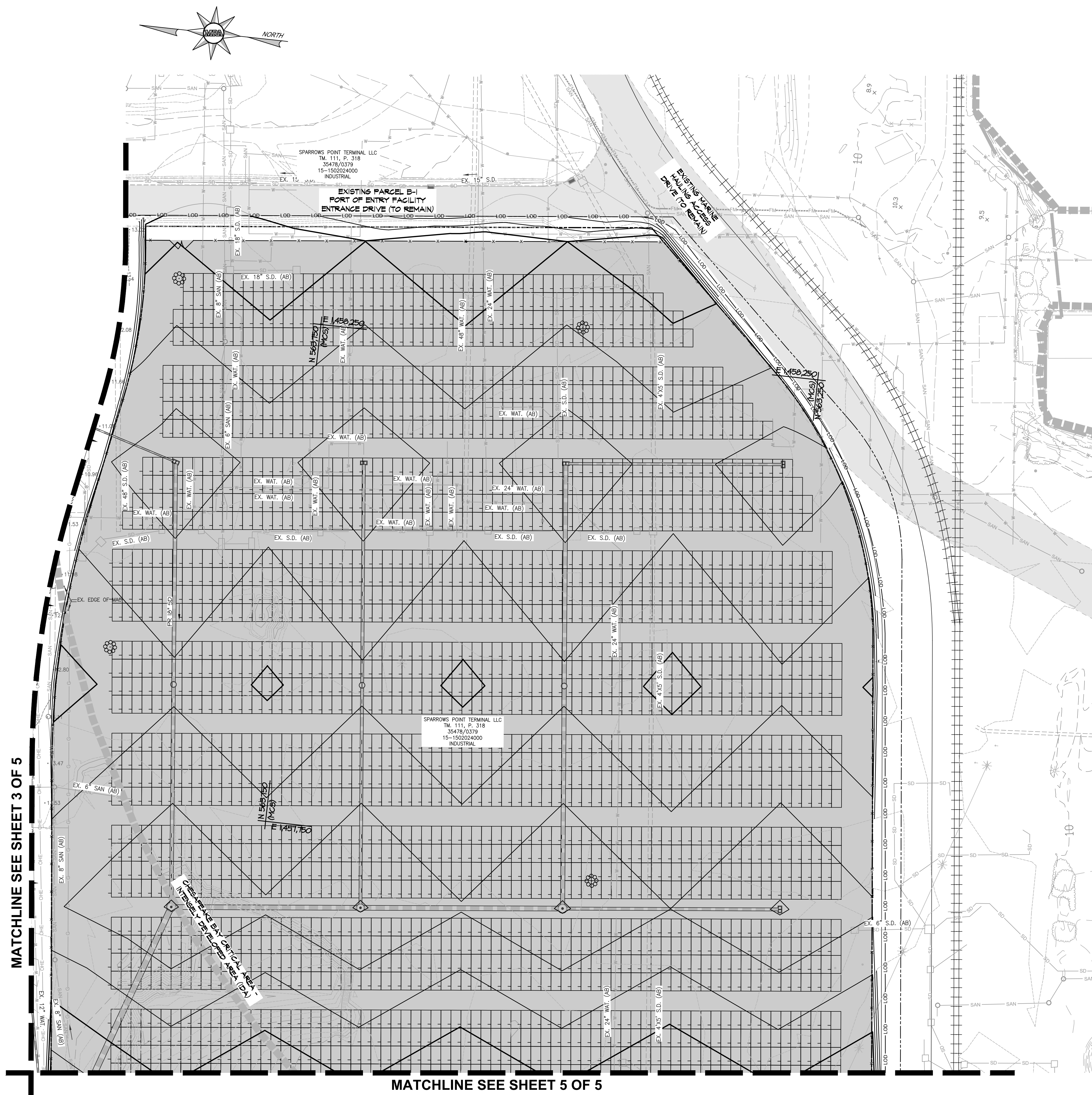
PROFESSIONAL CERTIFICATION:
I (MARK G. DIPIETRO) HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 34622, EXPIRATION DATE: 8/23/2021.



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RORO PHASE 2 - IMPORT FACILITY AND PROCESSING CENTER
MDE DEVELOPMENT PLAN
FOR
TPA - RORO PHASE 2
1300 & 1301 SHIPYARD ROAD
SPARROWS POINT, MARYLAND

JOB NO: 20519
SCALE: 1" = 50'
DATE: 7/1/2021
DRAWN BY: CEM
DESIGN BY: CEM
REVIEW BY: AGD
SHEET: 03 OF 05



LEGEND	
	EXISTING LINE
	LEASE LINE
	CL. OF ROAD
	EDGE OF PAVING
	CURB
	1' CONTOURS
	5' CONTOURS
	100-YEAR FLOODPLAIN
	STORM DRAIN
	WATER
	SANITARY SEWER
	TREE LINE
	FENCE
	EXISTING PAVEMENT
	PROPOSED EDGE OF PAVING
	PROPOSED CURB
	PROPOSED BUILDING SETBACK
	PROPOSED EASEMENT
	PROPOSED 1' CONTOUR
	PROPOSED 5' CONTOUR
	PROPOSED STORM DRAIN
	PROPOSED WATER
	PROPOSED SANITARY SEWER
	PROPOSED SANITARY FORCE MAIN
	LIMIT OF CLEARING
	LIMIT OF DISTURBANCE
	PROPOSED PAVEMENT

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MATCHLINE SEE SHEET 3 OF 5

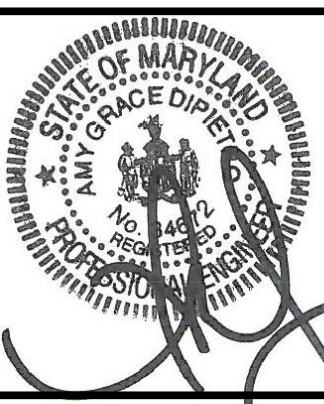
MATCHLINE SEE SHEET 5 OF 5

DRC No. 101519D
GRADING PERMIT No.
SWM PERMIT No.
MDE TRACKING No.
EPS TRACKING No.

DATE	REVISIONS

OWNER/DEVELOPER

TRADEPOINT ATLANTIC
1600 SPARROWS POINT BOULEVARD
BALTIMORE, MARYLAND 21219
PHONE: (443) 452-1509
ATTN: MR. PETE HAID



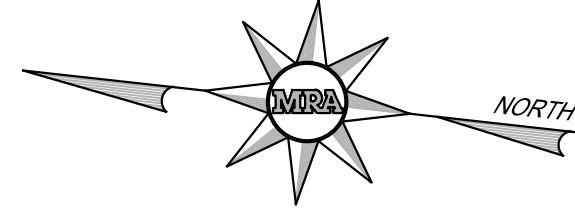
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LICENSE NO. 34622, EXPIRATION DATE: 8/23/2021.



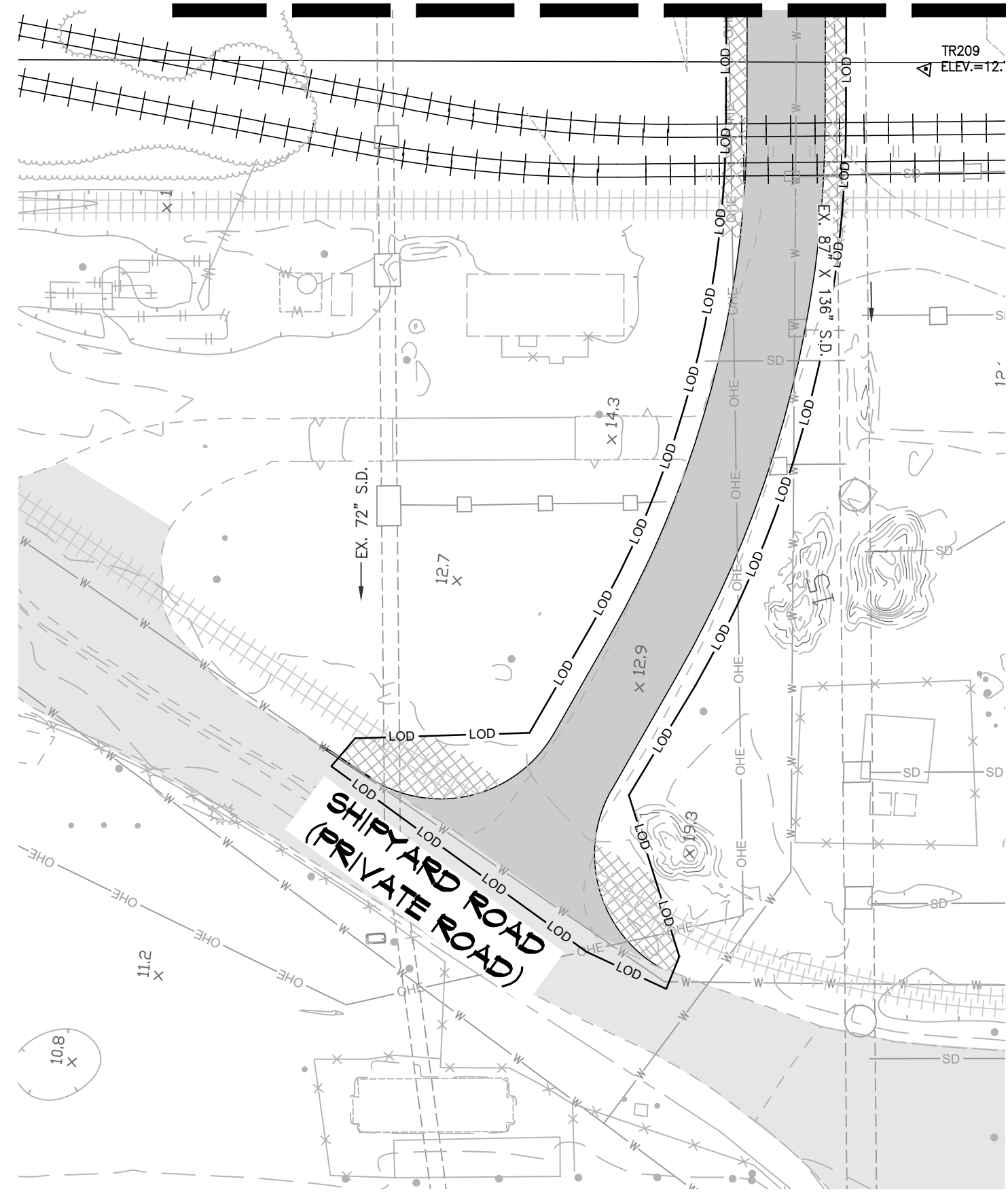
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RORO PHASE 2 - IMPORT FACILITY AND PROCESSING CENTER
MDE DEVELOPMENT PLAN
FOR
TPA - RORO PHASE 2
1300 & 1301 SHIPYARD ROAD
SPARROWS POINT, MARYLAND

DESIGN & DRAWING BASED ON MARYLAND COORDINATE SYSTEM (MCS): HORIZONTAL NAD 83 (1991) VERTICAL NAVD 88
JOB NO: 20519
SCALE: 1" = 50'
DATE: 7/1/2021
DRAWN BY: CEM
DESIGN BY: CEM
REVIEW BY: AGD
SHEET: 04 OF 05



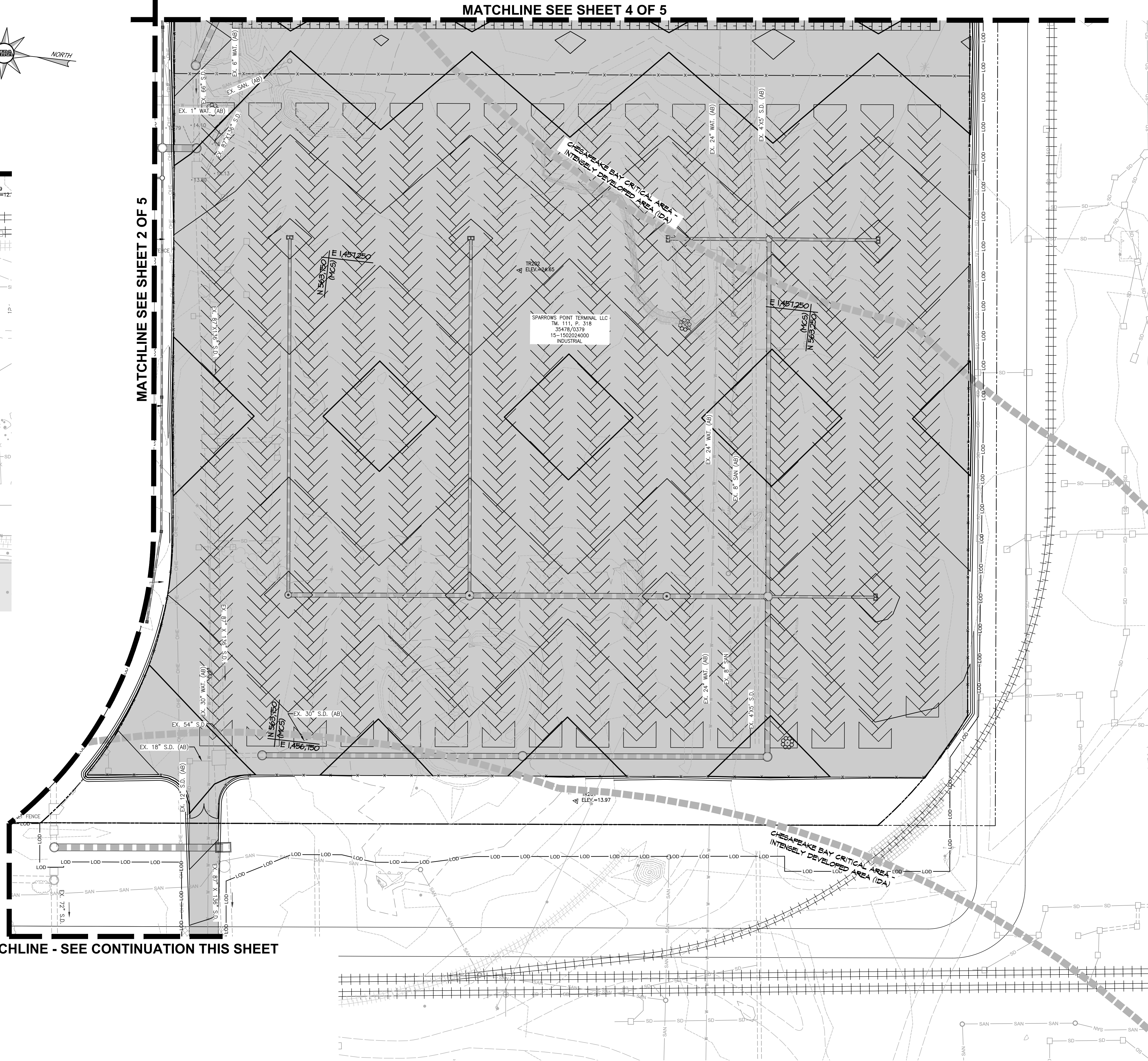
MATCHLINE - CONTINUATION



MATCHLINE SEE SHEET 4 OF 5

MATCHLINE SEE SHEET 2 OF 5

MATCHLINE - SEE CONTINUATION THIS SHEET



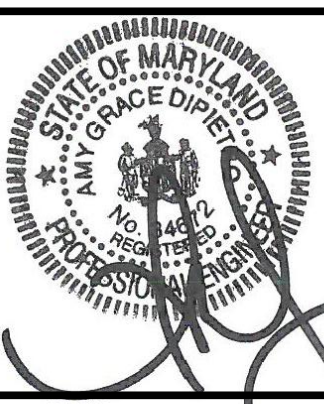
LEGEND

- EXISTING EASEMENT LINE
- EXISTING LEASE LINE
- EXISTING CL. OF ROAD
- EXISTING EDGE OF PAVING
- EXISTING CURB
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- EXISTING FENCE
- EXISTING PAVEMENT
- PROPOSED EASEMENT LINE
- PROPOSED LEASE LINE
- PROPOSED CL. OF ROAD
- PROPOSED EDGE OF PAVING
- PROPOSED CURB
- PROPOSED BUILDING SETBACK
- PROPOSED EASEMENT
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
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- PROPOSED WATER
- PROPOSED SANITARY SEWER
- PROPOSED SANITARY FORCE MAIN
- PROPOSED LIMIT OF CLEARING
- PROPOSED LIMIT OF DISTURBANCE
- PROPOSED PAVEMENT

NOTE: NO BASEMENTS ARE BEING PROPOSED AS PART OF THIS PLAN. ALL BUILDINGS SHALL CONSIST OF SLAB ON GRADE CONSTRUCTION.

DATE	REVISIONS

OWNER/DEVELOPER
TRADEPOINT ATLANTIC
 1600 SPARROWS POINT BOULEVARD
 BALTIMORE, MARYLAND 21219
 PHONE: (443) 452-1509
 ATTN: MR. PETE HAID



PROFESSIONAL CERTIFICATION:
 I (TAMY G. DIPIETRO) HEREBY
 CERTIFY THAT THESE DOCUMENTS
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 BY ME, AND THAT I AM A DULY
 LICENSED PROFESSIONAL
 ENGINEER UNDER THE LAWS OF
 THE STATE OF MARYLAND.
 LICENSE NO. 34672, EXPIRATION
 DATE: 8/23/2021.



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 MDE DEVELOPMENT PLAN
 FOR
 TPA - RORO PHASE 2
 1300 & 1301 SHIPYARD ROAD
 SPARROWS POINT, MARYLAND

DESIGN & DRAWING BASED ON
 MARYLAND COORDINATE SYSTEM (MCS):
 HORIZONTAL NAD 83 (1991)
 VERTICAL NAVD 88

JOB NO: 20519
 SCALE: 1" = 50'
 DATE: 7/1/2021
 DRAWN BY: CEM
 DESIGN BY: CEM
 REVIEW BY: AGD
 SHEET: 05 OF 05

ATTACHMENT 2

**Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel B4-2 Expansion**

Description	Variable	Value
Days worked per week	DW	5
Exposure duration (yr)	ED	1
Hours worked per day	ET	8
A/constant (unitless) - particulate emission factor	Aconst	12.9351
B/constant (unitless) - particulate emission factor	Bconst	5.7383
C/constant (unitless) - particulate emission factor	Cconst	71.7711
Dispersion correction factor (unitless)	FD	0.185
Days per year with at least .01" precipitation	P	130
Target hazard quotient (unitless)	THQ	1
Body weight (kg)	BW	80
Averaging time - noncancer (yr)	ATnc	1
Soil ingestion rate (mg/d)	IR	330
Skin-soil adherence factor (mg/cm ²)	AF	0.3
Skin surface exposed (cm ²)	SA	3300
Event frequency (ev/day)	EV	1
Target cancer risk (unitless)	TR	01E-06
Averaging time - cancer (yr)	ATc	70
A/constant (unitless) - volatilization	Aconstv	2.4538
B/constant (unitless) - volatilization	Bconstv	17.566
C/constant (unitless) - volatilization	Cconstv	189.0426
Dry soil bulk density (kg/L)	Pb	1.5
Average source depth (m)	ds	3
Soil particle density (g/cm ³)	Ps	2.65
Total soil porosity	Lpore/Lsoil	0.43
Air-filled soil porosity	Lair/Lsoil	0.28

**Construction Worker Soil Screening Levels
Maximum Allowable Work Day Exposure
Calculation Spreadsheet - Sub-Parcel B4-2 Expansion**

Area of site (ac)	Ac	35.4
Overall duration of construction (wk/yr)	EW	11
Exposure frequency (day/yr)	EF	55
Cars per day	Ca	5
Tons per car	CaT	2
Trucks per day	Tru	5
Tons per truck	TrT	20
Mean vehicle weight (tons)	w	11
Derivation of dispersion factor - particulate emission factor (g/m ² -s per kg/m ³)	Q/Csr	13.8
Overall duration of construction (hr)	tc	1,848
Overall duration of traffic (s)	Tt	1,584,000
Surface area (m ²)	AR	143,259
Length (m)	LR	378
Distance traveled (km)	ΣVKT	208
Particulate emission factor (m ³ /kg)	PEFsc	135,216,186
Derivation of dispersion factor - volatilization (g/m ² -s per kg/m ³)	Q/Csa	6.92
Total time of construction (s)	Tcv	1,584,000

Input
Calculation

Chemical	RfD & RfC Sources	[^] Ingestion SF (mg/kg-day) ₁	[^] Inhalation Unit Risk (ug/m ³) ⁻¹	[^] Subchronic RfD (mg/kg-day)	[^] Subchronic RfC (mg/m ³)	[^] GIABS	Dermally Adjusted RfD (mg/kg-day)	[^] ABS	[^] RBA	[*] Dia	[*] Diw	[*] Henry's Law Constant (unitless)	[*] Kd	[*] Koc	DA	Volatilization Factor - Unlimited Reservoir (m ³ /kg)	Carcinogenic Ingestion/ Dermal SL (SLing/der)	Carcinogenic Inhalation SL (SLinh)	Carcinogenic SL (mg/kg)	Non-Carcinogenic Ingestion/ Dermal SL (SLing/der)	Non-Carcinogenic Inhalation SL (SLinh)	Non-Carcinogenic SL (mg/kg)
Arsenic, Inorganic	I/C	1.50E+00	4.30E-03	3.00E-04	1.50E-05	1	3.00E-04	0.03	0.6			-	2.90E+01				68.9	43,824	68.8	443	40,380	438
Chromium(VI)	A/C/I	5.00E-01	8.40E-02	5.00E-03	3.00E-04	0.025	1.25E-04	0.01	1			-	1.90E+01				102	2,243	97.9	3,656	807,609	3,640
Cobalt	P	-	9.00E-03	3.00E-03	2.00E-05	1	3.00E-03	0.01	1			-	4.50E+01					20,938	20,938	4,686	53,841	4,311
Iron	P	-	-	7.00E-01	-	1	7.00E-01	0.01	1			-	2.50E+01							1,093,370		1,093,370
Manganese (Non-diet)	I	-	-	2.40E-02	5.00E-05	0.04	9.60E-04	0.01	1			-	6.50E+01							22,064	134,602	18,956
Thallium (Soluble Salts)	P	-	-	4.00E-05	-	1	4.00E-05	0.01	1			-	7.10E+01							62.5		62.5
Vanadium and Compounds	A	-	-	1.00E-02	1.00E-04	0.026	2.60E-04	0.01	1			-	1.00E+03							7,470	269,203	7,268
Benz[a]anthracene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	2.60E-02	6.70E-06	4.91E-04	1.08E+03	1.80E+05	6.71E-10	1.07E+5	810	2,490	611			
Benzo[a]pyrene	I	1.00E+00	6.00E-04	3.00E-04	2.00E-06	1	3.00E-04	0.13	1	4.80E-02	5.60E-06	1.87E-05	3.54E+03	5.90E+05	2.37E-11	5.71E+5	81.0	1,322	76.3	347	22.7	21.3
Benzo[b]fluoranthene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.80E-02	5.60E-06	2.69E-05	3.60E+03	6.00E+05	2.91E-11	5.15E+5	810	11,921	759			
Dibenz[a,h]anthracene	I	1.00E+00	6.00E-04	-	-	1		0.13	1	4.50E-02	5.20E-06	5.76E-06	1.14E+04	1.90E+06	4.13E-12	1.37E+6	81.0	314,070	81.0			
Indeno[1,2,3-c,d]pyrene	I	1.00E-01	6.00E-05	-	-	1		0.13	1	4.50E-02	5.20E-06	1.42E-05	1.20E+04	2.00E+06	5.62E-12	1.17E+6	810	27,015	787			
Naphthalene	C/I/A	1.20E-01	3.40E-05	2.00E-02	3.00E-03	1	2.00E-02	0.13	1	6.00E-02	8.40E-06	1.80E-02	9.00E+00	1.50E+03	6.35E-06	1.10E+3	675	45.2	42.4	23,148	65.9	65.7

^{*}chemical specific parameters found in Chemical Specific Parameters Spreadsheet at <https://www.epa.gov/risk/regional-screening-levels-rsls>
[^]chemical specific parameters found in Unpaved Road Traffic calculator at https://epa-prgs.oml.gov/cgi-bin/chemicals/csl_search
I: chemical specific parameters found in the IRIS at <https://www.epa.gov/iris>
C: chemical specific parameters found in Cal EPA at <https://www.dtsc.ca.gov/AssessingRisk>
A: chemical specific parameters found in Agency for Toxic Substances and Disease Registry Minimal Risk Levels (MRLs) at https://www.atsdr.cdc.gov/mrls/pdfs/atsdr_mrls.pdf
P: chemical specific parameters found in the Database of EPA PPRTVs at <https://hhprrtv.oml.gov/quickview/pprtv.php>