



ARM Group Inc.

Earth Resource Engineers and Consultants

October 7, 2016

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

Re: Response and Development Work Plan
Parcel B22, Phase 1 (Revision 3)
Response to MDE/USEPA Comments
Tradepoint Atlantic
Sparrows Point, MD 21219

Dear Ms. Brown:

On behalf of EnviroAnalytics Group, LLC (EAG), ARM Group Inc. (ARM) is pleased to provide the following responses to comments received from the Maryland Department of the Environment (MDE) and the United States Environmental Protection Agency (USEPA) in an email dated September 22, 2016. A follow-up email was also sent on September 23, 2016 containing additional comments. The MDE and USEPA provided comments on the previously submitted Response and Development Work Plan (Revision 2) for Parcel B22 Phase 1 of the Tradepoint Atlantic property located in Sparrows Point, Maryland. This comment response letter documents the updates made between the previous submission (Revision 2 dated August 30, 2016) and current version (Revision 3 dated October 7, 2016) included in this submission. Responses to specific comments are provided below.

Responses to Comments Received on September 22, 2016:

1. *Section 3.5.1, Identification of COPCs paragraph – Revise the first sentence as follows: “Analytical results for the parcel soils were compared to the Project Action Limits (PALs), which are the USEPA Industrial Soil Regional Screening Levels (RSLs).”*

This sentence has been revised as requested.

2. *Section 3.5.1, EPC paragraph:*
 - a. *Revise the first sentence of this paragraph to refer to the COPC data, rather than the site data.*

This sentence has been revised as requested.

- b. *Revise this paragraph to delete discussion of calculating the 95% UCL for lead for “assessing cancer risk.” The Cal EPA oral slope factors and unit risks available in the RSL table are applicable only to the specific lead species for which they are listed, which were not determined analytically for Parcel B22. Note that the RSL table lists no slope factor for “lead and compounds,” which applies to the Parcel B22 analytical results for lead.*

This paragraph has been revised as requested.

- c. *Add the following two sentences to the end of this paragraph: “For lead, the arithmetic mean for each EU is calculated for comparison to the Adult Lead Model-based values. For PCBs, all results equaling or exceeding 50 mg/kg will be delineated for excavation and removal. All PCB results less than 50 mg/kg will be included in the 95% UCL and risk ratio calculations.”*

These two sentences were added to the end of the paragraph as requested. Risk assessment tables were also revised in accordance with these statements.

3. *Section 3.5.1, Risk Ratio paragraph – Replace this paragraph with the following and correct the Risk Ratio tables accordingly:*

The surface soil 95% UCLs were compared to the USEPA RSLs for the Composite Industrial Worker, and the subsurface soil 95% UCLs were compared to the Calculator-based RSLs for Construction Worker, Soil – Other Construction Activities to develop risk ratios for each COPC. The risk ratios were calculated with a cancer risk of 1E-6 and a non-cancer Hazard Quotient 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 risk.

This paragraph has been revised as requested. The risk assessment was completed in accordance with these requirements, and updated risk ratios for the Composite and Construction Worker scenarios can be found in **Table 16** and **Table 17**.

4. *Section 3.5.1, Assessment of Lead paragraph:*

- a. *The lead arithmetic means do not belong in UCL tables. Revise to present the lead means in a separate table.*

The lead arithmetic means were removed from the UCL tables (**Table 14** and **Table 15** in the revised Development Plan). The arithmetic means are given in **Table 13**, and a reference to this new table is given in Section 3.5.1, Assessment of Lead.



- b. *For this report only, present the pre-delineation and post-delineation lead means for comparison. In the future, delineation of elevated lead concentrations will not be necessary unless there are lead results equal to or greater than 10,000 mg/kg. In such a case, splits must be available for the XRF-generated results in case the XRF results raise the mean. The splits would then have to be submitted for laboratory analyses.*

Table 13 includes both the pre- and post-delineation mean values for lead in each exposure unit. The reference to the table in Section 3.5.1 clarifies this point.

- c. *For the second and final sentences of this paragraph, revise to add “for lead” to the end of each sentence (i.e., no further action for lead).*

“For lead” was added to these sentences in the requested locations. The lead RSL (800 mg/kg) was also added to the first sentence of this paragraph for additional clarity.

5. *Section 3.5.1 – Add a new paragraph to this section as follows:*

Assessment of TPH-DRO: *95% UCLs were not calculated for TPH-DRO. Instead, the individual results were compared to the PAL set to a hazard quotient of 1 (6,200 mg/kg). The surface location exceeding the PAL (162-SB1 at 39,100 mg/kg) will be delineated for excavation. The other location exceeding the PAL (163-SB5) is at five feet bgs and will be evaluated for proximity to utilities.*

This paragraph was added to Section 3.5.1 as requested, however the final sentence was revised to indicate that DRO contamination associated with B22-163-SB-5 will also be excavated and removed. Since both locations with elevated DRO are located directly adjacent to each other, both locations were planned for concurrent excavation.

6. *Section 3.5.1, Risk Characterization Approach:*

- a. *Revise the first sentence of this section to delete “does not exceed 10,” and revise as follows: “and the sum of the risk ratios for the carcinogenic COPCs does not exceed a cumulative cancer risk of 1E-5”.*

This sentence has been revised as requested.

- b. *Revise the second sentence as follows: “If the baseline estimate of cumulative cancer risk exceeds 1E-5, but is less than 1E-4, then capping of the EU will be considered an acceptable presumptive remedy. 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.”*



This sentence has been revised as requested.

- c. *Revise the lead discussion to include the concentration range from the default ALM associated with the 5% to 10% probability range.*

An additional sentence has been added to this section to clarify that the mean soil lead concentrations corresponding to ALM probabilities of 5% and 10% are 1,235 mg/kg, and 2,000 mg/kg, respectively.

- d. *Revise the beginning of the third paragraph as follows: “If the sum of the risk ratios for carcinogens exceeds 1E-4”.*

This sentence has been revised as requested, with an additional clarification that the cumulative cancer risk which exceeds 1E-4, not the risk ratio. It reads as follows: “If the sum of the risk ratios for carcinogens exceeds a cumulative cancer risk of 1E-4...”

- e. *Revise the second sentence of the third paragraph as follows: “The magnitude of non-carcinogen hazard exceedance and bioavailability of the COPC will also dictate further analysis of site conditions including consideration of toxicity reduction in any proposal for a remedy.”*

This sentence has been revised as requested.

7. *Section 3.5.2, Parcel B22 SLRA Results:*

- a. *Revise this section and tables to only present the 95% UCLs and risk ratios that include all of the delineation data (currently Tables 17-20). When including XRF data, revise to include all of the XRF data rather than just the maximums in the 95% UCL calculations.*

This section has been revised to clarify that all delineation and supplemental investigation data from within the Phase 1 Development Area are included in the risk assessment dataset. The UCLs and risk ratios (now **Table 14** through **Table 17**) were computed including all of this supplemental data. All XRF data were included in the revised computations, instead of only maximum values. The four tables previously included in Revision 2 of the Response and Development Work Plan which did not include this supplemental data have been removed, and all trailing tables have been renumbered as necessary.

- b. *Create a separate table for the lead averages and remove from the UCL and Risk Ratio tables.*



The lead data is now presented in a separate **Table 13** (see Comment # 4), and is no longer included in the UCL or risk ratio tables.

- c. *Revise this section to also discuss the results of any target organ summation.*

This section now includes a discussion of the results of the Composite Worker (surface soil) and Construction Worker (subsurface soil) scenarios, including both cancer and non-cancer risks. This includes target organ summation for non-carcinogens. The target organ summation is presented with the risk ratio computations in **Table 16** and **Table 17**.

- d. *Revise this section to discuss the results of the DRO evaluation.*

This section now includes a paragraph discussing the results of the TPH analysis, including the intention to excavate and remove soil exceeding 6,200 mg/kg DRO.

- e. *Appendices B and C only include the ProUCL output files. Please revise to provide all input files as well, electronic for both are preferred.*

Appendix B and Appendix C have been removed from the document, and have been replaced with “Electronic Attachments” containing the ProUCL input and output tables. The input and output tables are provided as Excel files in designated folders on each CD accompanying the hard copy submission of the revised Response and Development Work Plan.

8. *Tables 11 and 12 – Revise these tables to include units for the XRF results.*

These tables have been revised to include the XRF units for each compound.

9. *Tables 17-18:*

- a. *Revise all “UCLs” to 95% UCLs.*

Headings have been revised in **Table 14** and **Table 15** (renumbered) to identify “EPCs” rather than “UCLs”. The 95% UCLs were not used in every case (see Comment #17c). This term has also been replaced throughout the text (including language dictated by previous comments) to identify EPCs rather than UCLs as appropriate.

- b. *The Category column is unnecessary and can be removed.*

This column has been removed from both tables as requested.



- c. *Revise to include the 95% UCL units and add columns for the type of each individual 95% UCL.*

The units have been added to these two tables where appropriate and an additional column has been added to clarify the type of EPC for each compound. The 95% UCLs were not used as the EPC in every case. The type of UCL was selected based on the maximum UCL value recommended in the ProUCL output tables (electronic attachments), or the maximum result if no UCL could be computed.

10. *Tables 17 – 20:*

- a. *Individual PCB Aroclor UCLs are not necessary, except for Aroclor 1254, which can be separately assessed for non-cancer hazard. Therefore, revise to provide only two 95% UCLs for PCBs – total (including 1254) and 1254 only.*

The EPC and risk ratio tables (renumbered as **Table 14** through **Table 17**) have been revised to only include these two PCB groups, rather than all individual Aroclors.

- b. *Delete DRO UCLs from all tables.*

DRO has been removed from each of the tables as requested.

11. *Tables 19 – 20:*

- a. *Revise the title of these tables to replace “RAIS Summary” with Risk Ratios.*

The titles of the risk ratio tables (renumbered as **Table 16** and **Table 17**) have been revised as requested.

- b. *Replace all “UCLs” with 95% UCLs.*

The table headings have been revised to identify “EPCs” rather than “UCLs”. The 95% UCLs were not used in every case. This term has also been replaced throughout the text (including language dictated by previous comments) to identify EPCs rather than UCLs as appropriate.

- c. *Revise “HI” to HQ. If individual target organ HQs are summed, than that would be a Hazard Index.*

The HI columns in the risk ratio tables have been revised to indicate that they are in fact HQ columns.



- d. *Add target organ columns for the non-cancer effects and sum any shared target organ HQs.*

A column for the target organ(s) of each compound has been added to the risk ratio tables. The summation of individual target organ risks is presented on the same tables below the risk ratios, with the results labelled as the total HI for each target organ.

- e. *Replace the Excavation Worker with the RSL Table Calculator-based Construction Worker, Soil – Other Construction Activities. These activities can be tailored to each parcel. For each screening level risk assessment, provide documentation of the parameters selected for each activity (excavating, dozing, grading, tilling). Zero can be selected for activities that will not occur (e.g., tilling).*

The Excavation Worker Scenario was replaced with the Construction Worker Scenario, with site-specific screening levels computed using the RSL Table Calculator. The discussion of the SLRA results in Section 3.5.2 has been updated with this change. The parameters used in the calculator are given on **Table 17**.

- f. *Remove lead from these tables.*

Lead has been removed from the risk ratio tables. The lead data is now presented in a separate **Table 13** (see Comment # 4).

- g. *Revise to cite the PRGs exactly as shown in the RSL Tables, rather than showing slight rounding differences.*

The PRGs given on the risk ratio tables are shown exactly as they appear in the RSL tables without rounding differences.

12. *Section 5.1.1 – This section states that PCB confirmatory samples will be collected from excavation bottom and sides at a minimum of one every 5,000 square feet. This does not provide adequate confirmation. The appropriate number of confirmation samples is dependent on the size of the individual excavation. PCB excavation plans should be submitted to the Agencies for confirmation sampling guidance.*

This section has been revised to increase the density requirement for confirmation samples from the PCB remedial excavations planned for parcel B-22, Phase 1. This section now states that “soil samples will be collected from each side wall of each excavation (unless limited by concrete), as well as from the bottom of each excavation at a minimum of one every 2,000 square feet.” A figure indicating the location of PCB



excavations and associated confirmation samples for parcel B-22, Phase 1 has been previously submitted to the agencies for review and confirmation sampling guidance. Final confirmation locations will be defined based on the extent of excavation required to achieve the remedial requirement for removal of PCBs. Corresponding data will be documented in the Completion Report. An additional paragraph discussing the excavation plan for DRO has also been added to this section with the same confirmation sampling requirements.

13. *Section 5.2.3 and Appendix F – The use of 100 x PAL is not acceptable to determine whether excavated materials can be used for on-site fill. The analytical results for any excavated materials must be evaluated via the same screening level risk assessment process to be used for investigation data. Revise accordingly.*

This section has been revised to indicate that potentially contaminated soils excavated and considered for replacement at the Site will be evaluated in terms of overall risk. Analytical data from excavated soils that would be proposed for re-use on site will be incorporated into the SLRA for the particular exposure unit where the material will be placed to determine if the materials might pose an unacceptable cancer or non-cancer risk given the conditions under which the material will be used (i.e., replaced under paved areas, etc.).

14. *Section 5.2.4 – Delete the reference to Appendix F in this section.*

The reference to the soil screening table has been removed from this section. With the exception of the material identified to be removed from the Site due to PCB or DRO levels, the remaining material has been determined to be suitable for placement under capped areas of the Site based on the SLRA procedure.

15. *Appendix F, Screening Levels (100x PAL) – Remove this appendix because it has no use.*

This appendix has been removed as requested.

16. *Appendix G, Containment Remedy Operations and Maintenance Plan – This plan is titled Parcel B4-1. Revise to specify Parcel B22, Phase 1.*

The Operations and Maintenance Plan (**Appendix D**) has been revised to correctly identify Parcel B22, Phase 1.

Responses to Comments Received on September 23, 2016:

17. *Item 8, page 17-Landscaping and Figure 16a and any other drawings in Appendix. Remove any reference to slag as clean fill in the landscaped areas as part of the remedial cap.*



The reference to slag fill in landscaped areas has been removed from the discussion of the Development Phase (Item 8, page 20). Similar references to the use of slag fill in landscaped areas as a replacement for clean fill have been removed from **Figure 14b** (renumbered).

18. *The O&M plan must include procedures for ensuring the landscaping cap is inspected and maintained to prevent exposure. An approved example from a VCP site is attached for your reference.*

The Operations and Maintenance Plan (**Appendix D**) has been revised to include relevant procedures for inspection and maintenance of landscaped caps.

Additional Revisions:

19. Validation has been completed ($\geq 50\%$) for soil and groundwater data relevant to the Parcel B22, Phase 1 Response and Development Work Plan. New references to the data validation reports have been included for soil and groundwater data in Section 3.2 and Section 3.3, respectively. The validation reports have now been included as additional electronic attachments. All exceedance figures (**Figure S-1** through **Figure S-4**; **Figure GW-1** through **Figure GW-8**) have been updated to include validation flags where applicable, and laboratory flags for data which was not validated. All analytical data tables have been revised as appropriate to include final validation flags (**Table 1** through **Table 10**).
20. Supplemental PCB delineation for Parcel B-22, Phase 1 is complete. Additional information about the supplemental PCB delineation has been added to Section 3.4 (“PCBs”). **Figure 7** and **Figure 8** have been revised to include the additional analytical information and final delineation boundaries. The delineation data tables (**Table 5** and **Table 6**) have been revised to include the additional analytical information.
21. Section 4.0 Response Phase (Item 2) has been renamed as “PCB & DRO contaminated media delineation and remedial action” to include DRO excavation remedial requirements in addition to the PCB excavation requirements. An additional paragraph has been added to provide the DRO Phase II results and excavation plan. **Figure 17** has been added as a new figure in the Response and Development Work Plan to document the proposed boundary of excavation, which may be modified based on field observations and confirmation sample results. The discussion of PCBs has also been updated to include updated volume calculations for PCB excavation, and references **Figure 7** and **Figure 8**.
22. Section 5.5.1 has been renamed as “PCB & DRO Contaminated Media Delineation and Remediation” to include the DRO excavation in addition to the PCB excavation. An



additional paragraph has been added discussing the general excavation and disposal plan for DRO contaminated soils.

23. Section 5.1.3 (Water Management) has been expanded to include a discussion of the DRO excavation plan. Since DRO excavation will not extend below the water table, water management is not expected to be a factor.
24. The “DRO Excavation” and “Slag Hauling and Placement” have been added as additional milestones in Section 7.0 (Implementation Schedule). All dates in the schedule have been updated.

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

Respectfully submitted,
ARM Group Inc.



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