Responses to Comments
Draft Site 2 Expanded Remedial Investigation Report
St. Juliens Creek Annex
Chesapeake, Virginia

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Comments from VDEQ, provided 16 June 08.

1. ***Comment:*** *Page 5-9, first paragraph – Inorganics in SJS02-MW02S*
   As stated in this paragraph, "Concentrations in this well are likely influenced by the brackish tidal water flux and migration of groundwater under reducing conditions into this area." Do we have data to support this theory (i.e. salinity levels in groundwater at this well, data indicating reducing conditions in groundwater at this well, etc.)? If so, please include.

   Response: Salinity concentrations greater than 1,000 ppm are representative of a saline environment. The salinity of the groundwater measured in SJS02-MW02S was 3,000 ppm, slightly to moderately saline, indicating that brackish tidal water flux from St. Juliens Creek is occurring in the groundwater in the vicinity of SJS02-MW02S. Additionally, ORP levels in this well and in wells located immediately upgradient (SJS02-MW14S, SJS02-PZ02, SJS02-PZ06, and SJS02-PZ09) ranged from -199 to -11 and were lower than the ORP levels in background wells, indicating groundwater flowing into this area is reducing. This information will be included in the text.

2. ***Comment:*** *Page 5-10, third paragraph, last sentence & Page 5-14, middle paragraph, third sentence –MCLs for naphthalene*
   On page 5-10 it states, "No MCLs have been established for caprolactum, naphthalene, and bis(2-Ethyhexyl)phthalate." On page 5-14 it states, "…and naphthalene was the only SVOC that exceeded the MCLs." Note the discrepancy, please clarify.

   Response: No MCL has been established for naphthalene. The sentence will be revised to delete "and naphthalene was the only SVOC that exceeded the MCLs."

3. ***Comment:*** *Figure 6-1 – Conceptual Site Model*

In order to visually capture the source area, please add a visual depiction of DNAPL in locations where DNAPL is likely present based on site data. This should be added to the cross section view

Response: The CSM will be revised to visually depict the likely locations of DNAPL at the site.

4. ***Comment: Section 9 – Risk Management Considerations***
   - *Chloroform* – The method detection limit exceeded the MCL in eleven samples, therefore, it is unknown if the MCL has been exceeded at locations other than MW10S. Continued monitoring using appropriate detection limits is recommended in order to evaluate actual chloroform levels.
   - *Methylene chloride* – The method detection limit exceeded the MCL in sixteen samples, therefore, it is unknown if the MCL has been exceeded at locations other than MW07S. Continued monitoring using appropriate detection limits is recommended in order to evaluate actual methylene chloride levels.
   - *Naphthalene* – Due to risk posed to future adult and child residents and since naphthalene was not detected in MW08S or MW11S (also downgradient from the asphalt parking lot), naphthalene should be retained as a CoC.
   - *Heptachlor epoxide* – Due to risk posed to future adult and child residents and since sampling for heptachlor epoxide subsequent to the 2003 sampling event detecting the MCL exceedance was not performed, continued monitoring is recommended.
   - *Arsenic* – Since arsenic levels can increase as a result of reducing conditions in the subsurface, monitoring of arsenic is recommended as part of any remedy which may produce a reducing environment.
   - *Thallium* – It is not clear that thallium was included in the risk screening for groundwater, additionally, no risk calculations can be found in the document. Please include the risk assessment data supporting the conclusion that, "No human health risks were identified."

Response:

- Chloroform and methylene chloride - The grab groundwater and piezometer samples were analyzed by SW846 8260B by an onsite laboratory. Due to high concentrations of TCE, many of the samples were screened at dilution in order to identify the appropriate dilution needed for TCE to obtain a concentration within the linear range of the instrument. As a result of sample dilution for TCE, the reporting limits for non-detected compounds were subsequently raised to account for the dilution factor. Sample dilution was necessary in order to prevent instrument damage and possible onsite laboratory shutdown which would have caused delays to the real-time decision making used to delineate the TCE plume.

Because of high TCE concentrations in many of the monitoring well samples, a low concentration VOC method, which would have yielded lower reporting limits was not utilized. It is not appropriate to use the low concentration method for samples with expected concentrations greater than 25 µg/L, and since average concentrations within the plume exceed 25 µg/L, the low concentration method was not used. For monitoring wells located on the perimeter of the plume, the low concentration VOC method was used as contaminant concentrations in these wells were expected to be low.

Therefore, chloroform and methylene chloride reporting limits were elevated due to dilution of the samples because of elevated concentrations of TCE and its daughter products. Although the reporting limits exceeded the MCLs for chloroform in 12 samples and methylene chloride in 20 samples, a total of 72 groundwater samples have been analyzed at the site and the majority of the samples had reporting limits below the MCLs. Chloroform and methylene chloride were never identified as site COCs and there is no reason to believe there is a plume associated with these constituents. All instances of reporting limits above the MCLs in individual samples have subsequent samples, co-located samples, or downgradient samples with low reporting limits that do not exceed the MCLs, see attached Figures 1 and 2. Furthermore, because samples collected using DPT may have turbidity issues and because site-wide permanent monitoring well data was available, the monitoring well data was used in the HHRA and no human health risks from exposure to chloroform and methylene chloride were identified. Therefore, it is believed that the extent of the contaminants has been adequately characterized.

Uncertainties associated with reporting limits above the MCLs will be addressed in Sections 5.1.6, 7.5, and 9.1 of the text. Notes will also be added to figures where appropriate.

- Naphthalene - Will be retained as a shallow groundwater COC and added onto Figure 10-2.
- Heptachlor epoxide - Will be retained as a shallow groundwater COC and added onto Figure 10-2.
- Arsenic - Text will be added to Section 10.2 to include that the evaluation of remedial alternatives will take into consideration the potential for mobilizing naturally occurring arsenic.
- Thallium - Shallow groundwater data collected at the site prior to 1999 was not used in the human health risk assessment in order to use the newest and most representative data available. Thallium was not detected in the groundwater data set used in the human health risk assessment and therefore was not retained as a COPC. Thallium was only detected in one well, MW02S, in 1997; however it was below the background UTL and

would not have been retained as a COC for the site.

5. ***Comment:*** *Page ix, first paragraph, sixth sentence* – change "chemical" to "chemicals"

   Response: The suggested change will be made.

6. ***Comment:*** *Page x, first paragraph below bullets, last sentence – change "dechlorinations" to "dechlorination is"*

   Response: The suggested change will be made.

7. ***Comment:*** *Page xi, last paragraph, second sentence* – change "based ingestion" to "based on ingestion"

   Response: The suggested change will be made.

8. ***Comment:*** *Page 2-3, second paragraph from bottom, first sentence* – correct the year in the citation

   Response: The citation in the sentence will be corrected to include the correct year.

9. ***Comment:*** *Figure 2-4, legend* – change "Shallow Monitoring Wells Locations" to "Shallow Monitoring Well Locations"

   Response: The suggested change will be made.

10. ***Comment:*** *Page3-5, second paragraph from bottom, fourth sentence* – "Soil ____ were logged…" please insert correct description (i.e. cuttings, borings, etc.)

    Response: The sentence will be amended to say "Soil borings were logged according to the Unified Soil Classification System (USCS)".

11. ***Comment:*** *Page 5-4, third full paragraph, second sentence* – change "it's" to "its"

    Response: The suggested change will be made.

12. ***Comment:*** *Page 5-4, last paragraph, first and second sentences* – Please confirm that concentrations are correct, currently both sentences state 14 billion parts per billion – is this correct?

    Response: The concentrations for the soil samples collected in 2007 were incorrectly reported with three additional significant figures. For example, the 14,000,000,000 µg/kg (ppb) should actually be 14,000,000 µg/kg. The associated text, tables, and figures will be amended to reflect the correct concentrations. The conclusions and recommendations of the report will not be affected by the change in concentrations.

13. ***Comment:*** *Page 5-8, last paragraph, third sentence* – change "MW06s" to "MW06S"

    Response: The suggested change will be made.

14. ***Comment:*** *Page 5-10, first paragraph, last sentence* – change "concentration" to "concentrations"

    Response: The suggested change will be made.

15. ***Comment:*** *Page 5-11, first full paragraph, first sentence* – change "St Juliens" to "St. Juliens"

    Response: The suggested change will be made.

16. ***Comment:*** *Page 5-13, second paragraph, last sentence* – change "UTLS" to "UTLs"

    Response: The suggested change will be made.

17. ***Comment:*** *Figure 5-14, legend* – change "Groundwater Sammpling Locations" to "Groundwater Sampling Locations"

    Response: The suggested change will be made.

18. ***Comment:*** *Figure 5-19* – according to Table 5-4, RDX was detected in monitoring well MW04S at a concentration of 2.70 ug/L – this is not depicted on Figure 5-19, please correct

    Response: The suggested change will be made.

19. ***Comment:*** *Figure 5-22* – two callout boxes point to the same sampling point, SD02 and SD26, please clarify which sampling point is correct

    Response: Samples SD02 and SD26 were collected at the same location; therefore, two callout boxes are associated with the same sampling point.

20. ***Comment: Figure 10-1:***

    - *in legend* – concentrations is misspelled
    - *in legend* – include the significance of the "C" found in the SJS17-SS03 callout box
    - three callout boxes point to two sampling points, SB04, SS08 and SS13, please clarify
    - callout box for SS12 points to sampling point labeled SB09, please clarify
    - the iron concentration depicted in the callout box for SS05 is highlighted as a human health and ecological risk driver while other, much higher, iron concentrations across the site only pose human health risk, please clarify

Response:

- The suggested changes to the legend will be made.
- Because samples SS08 and SS13 were collected only 0.5 ft apart, two separate sample points can not be shown on the figure due to the scale of the figure. Therefore, the callout boxes for these samples will point to the same sample location. Sample SB04 was collected approximately 4.5 ft from SS08 and SS13. The lines from the callout boxes to the sample locations will be clarified on the figure.
- Samples SS12 and SB09 were collected at the same location, the figure will be revised to include a separate sample symbol for co-located surface and subsurface soil sample locations.
- In several callout boxes, iron was inadvertently highlighted as only a human health risk driver in surface soil when it should have been highlighted as both an ecological and human health risk driver in surface soil. The ecological risk screening value for iron in surface soil is lower than the human health risk screening value in surface soil; therefore any concentration highlighted as a human health risk driver represents a concentration indicative of an ecological risk driver. The callout boxes will be revised to correctly identify the risk associated with iron in surface soil.

Comments from EPA, provided 23 June 08.

EPA General Comments:
EPA Comment 1
VOC Concentrations:
It appears that SB-205's VOC concentration has been exaggerated by 1,000 times as having 1,400% of a contaminant concentration is not possible. Please correct this data and determine if this error is only limited to an isolated sample, or if all data needs to be revised (does not appear so). Additionally, please correct the text where these errors were inserted (e.g. page 5-4 final paragraph). If this data was used in the HHRA, please revise is section.

Response: The concentrations for the soil samples collected in 2007 were incorrectly reported with three additional significant figures. For example, the 14,000,000,000 µg/kg (ppb) should actually be 14,000,000 µg/kg. The associated text, tables, and figures will be amended to reflect the correct concentrations. The conclusions and recommendations of the report will not be affected by the change in concentrations.

Areal Photograph:
EPA Comment 2
The ERI states that, adjacent to building 279 there were releases to "nearby soils (page v)". By looking at the available Site 2 sampling figure, it appears that no surface or subsurface soils samples have been taken in this area. Please address this data gap, or provide an explanation of why EPA would not be concerned with the soils or subsurface soils in the nearby area, or under the pad. (staining on pads from areal?)

Response: Soil associated with Building 279 was investigated during the Site 17 Supplemental Investigation. Four surface soil samples (SJS17-SO01 through SO04) were collected near or underneath the building foundation to address the releases. These data were included in the Expanded RI but missing from Figure 3-1. The sample locations will be added to the Figure 2-4. No further investigation in the area adjacent to former Building 279 is necessary.

Titles:
EPA Comment 3
Please remove one of the double Section # titles that are on the pages throughout the ERI.

Response: The suggested change will be made.

Specific Comments:
EPA Comment 4
Executive Summary, Page V:
The Executive Summary starts on Page V. There are no pages in the Report before the Executive Summary; it is not clear if the numbers are incorrect or if additional pages were intended to be included in the Report. Please provide an explanation of this.

Response: The report is formatted to include page numbers for blank pages that are set up for printing the document correctly. No pages were left out of the document.

Page ix, Sediment:
EPA Comment 5
"Therefore, the source of these chemical is likely the waste". Please change to chemical's".

Response: The suggested change will be made.

Section 2.1, Site Description and History, paragraph:
EPA Comment 6
The ERI states that, "Ordinance wastewaters and rinse waters were reportedly discharged into the inlet in the vicinity of former Building 130 and 257." However, sediment samples analyzed at SD01 and SD04, in the area of building 257, do not appear to have been analyzed (not shown in table 5-11, but box is checked on Table 2-1 Sample Summary) for any ordinance related constituents (i.e. TNT, DNT, and RDX). Although other media have been investigated for these constituents, it is important to sample sediment in these discharge points as TNT is hydrophobic and would not be found in water related media analysis. Composite samples and analysis 8330 B would be recommended when sampling for explosives. Additionally, there does not appear to be an apparent discharge point near Building 130. Please clarify where the discharge point near Building 130 was suspected to be. If additional samples are not taken in this area, please provide an explanation of why EPA would not be concerned with sediment containing explosives/munitions constituents in this area.

Response: Sediment samples SD01 and SD04, collected downgradient of former Building 257, were analyzed for explosives; however, no explosives were detected in the

samples. Explosives analysis will be added to the chemical list on Table 5-11, although no results will be listed since there were no detections. The full analytical results are presented in Appendix C. No specific discharge location associated with former Building 130 was identified. Surface and subsurface samples collected around former Building 130 and several sediment samples collected within the inlet at Site 2 are located downgradient of former Building 130 were analyzed for explosives and would have identified explosives contamination released from the building into the inlet. Therefore, additional investigation of explosives in the soils and sediments in the vicinities of former Buildings 130 and 257 is not warranted.

Section 3.2.8, Permanent Monitoring Well Installation and Sampling, Page 3-6
EPA Comment 7
The ERI states that "not all wells were sampled during each investigational phase". Please provide additional details on which wells were sampled when, and what drove the sampling to not include data from all wells during each event (i.e. sampling rounds). Further, final risk-based decisions need to be based on reproducible data points. Please revise the Report to include a table summarizing which wells were sampled when and how often.

Response: Table 2-1 depicts the monitoring wells sampled during each investigation and what the wells were sampled for. The basis for the monitoring wells selected for sampling during each investigation is provided in the associated work plans.

Section 3.3.2, Potential Non-Site-Related Analytical Results, Background Data Heading, Page 3-10:
EPA Comment 8
Please revise the ERI to state that the reference background document was approved by regulatory agencies.

Response: Text will be added to Section 3.2.10 to state that the reference background document was approved by the regulatory agencies.

Figure 3-1, Expanded Remedial Investigation Sampling Locations:
EPA Comment 9
Sample location SJS02-SD06 could not be located on this figure. Although showing the storm sewer system is important, the scale need to do this takes away from the sampling locations. Please include a separate figure that shows the immediate Site 2 area where sample locations are discernable.

Response: The storm water samples shown on Figure 3-1 will be shown on a separate figure in order to adjust the scale on Figure 3-1.

Section 4.3.3, Regional Water Usage, Page 4-7:
EPA Comment 10
Page 4-7 states that groundwater at the site is not currently nor expected to be used as a potable water supply and that the City of Chesapeake supplies drinking and industrial water for the site. The source of the City of Chesapeake's water is not provided. Please provide this information in the revised Report. (Did we follow the supplement?).

Response: There are three major water sources for the City of Chesapeake: the Northwest River Water Treatment Plant and the cities of Norfolk and Portsmouth, plus one auxiliary source, which is used during peak demand periods. The City's Northwest River Water Treatment Plant treats water from the Northwest River and brackish groundwater from four deep wells located along South Battlefield Boulevard. The City of Chesapeake treats water from the Western Branch Reservoir, Lake Prince, Lake Burnt Mills, Lake Wright, Lake Whitehurst, Little Creek Reservoir, Lake Smith, Lake Lawson, Lake Gaston, four deep wells, and Nottoway and Blackwater Rivers. The City of Portsmouth treats water from Lake Meade and five deep wells. This information will be added to Section 4.3.3.

Section 5. Nature and Extent of Contamination, Sentence:
EPA Comment 11
Please change "if the nature" to "of the nature".

Response: The suggested change will be made.

Section 5.1.2, Site Description and History/Wetland Surface Debris Delineation, Page 5-1:
EPA Comment 12
The ERI states that during the wetland surface debris delineation activities, several concrete slabs were located within the tidal inlet. No information on the historical use of the concrete slabs was provided. Please provide this information if it is available.

Response: The historical use of the concrete slabs has not been documented. It is possible that the concrete slabs were related to the historical activities at the site of filling in the inlet with debris or that they were placed as an erosion control measure. This information will be added to Section 5.1.2.

Table 5-9, Surface Water Detections and Table 5-12, Sediment Pore Water Detections:
EPA Comment 13
The surface water and pore water detections have not been compared to screening criteria and the levels of contamination are not easily discernable. For surface water, data may be compared to the National Recommended Water Quality Criteria or other applicable screening criteria if background data is not available. Please update the ERI to include a comparison screening criteria for the surface water and sediment pore water detections or provide an explanation of why this should not be done.

Response: The surface water and pore water will be screened against the Virginia Water Quality Standards (September 2007) and the text, tables, and figures will be updated as applicable.

Figure 5-4, Waste Delineation Cross-Section B-B' and Figure 5-5, Waste Delineation Cross-Section C-C':
EPA Comment 14
Based on the cross-sections presented, it appears that the extent of fill/trash was not fully delineated vertically at locations TP-22, TP-23, or TP-14 as no material is listed as being

present under the trash layer. Additionally, the DPT-6 and TP-14 the two outmost locations both contain trash. This makes the horizontal extent unclear. Please revise the Report to show areas of "no trash", or provide an explanation of why we would not be concerned with the nature and extent of the trash/landfill debris.

Response: Vertical delineation continued until waste was no longer encountered or test pitting could no longer continue (e.g., water table was encountered). It is possible that waste may be present deeper than the bottom of the test pits and will be acknowledged in the text and on the associated figures as an uncertainty. In instances where DPT were used for waste delineation the bottom extent of the waste was always identified and provides a reasonable of comfort with the maximum depth of waste present across the site. In instances where the outermost DPT or test pit location identified waste, physical features (e.g., current or former buildings or roads) and review of historical aerial photographs supported the horizontal delineation.

Appendix K, Correlation Plots:
EPA Comment 15
Since a major part of the plume delineation and hot spot identification was done using MIP, it is important to see a data correlation between the MIP and standard laboratory analysis. Although it appears the ERI attempts to do this through the last section of Appendix K it does not plot laboratory results versus MIP readings. While the MIP is not a specific number (i.e. 14,000,000ppb), it can still be plotted against laboratory samples taken in the same area using multiple scales.

Response: The correlation plots in Appendix K represent total CVOC concentrations against MIP voltage response. Total CVOC concentrations were selected for the plots over an individual chemical since the MIP will respond to all VOCs present in the subsurface; total CVOC concentrations were calculated using analytical laboratory results. Total CVOC concentrations were plotted against several MIP detector results (ECD maximum and average and PID maximum and average) to determine which of the MIP detector was most appropriate to use for site characterization. The titles on the correlation plots will be revised to clarify where the data input is from. Additionally the data used to create the trend plots, including the soil/groundwater sample and MIP station identifications, will be included in the appendix.

Figure 6-2, SJS02-MW07S, Concentration Trends:
EPA Comment 16
Please insert the values in a text box near to data points. Due to the scale of the figure, the actual trend is not apparent.

Response: The suggested change will be made.

Section 7.1.1 Data Evaluation and Selection, Page 7-3:
EPA Comment 17
Please explain how the 1999 shallow groundwater data "are more representative of current conditions" than the 1997 data. Through the historical review section, it appears that no new waste was added to the landfill between 1997 and 1999. It also appears that the data was representative enough of current conditions to be included in the deep

groundwater discussion. Please update the ERI to include the 1997 shallow groundwater data or update the historical activities section to include activities that have taken place since between 1997 and 1999 that would make the shallow groundwater data not representative of current conditions.

Response: As discussed in partnering the text will be revised to state "Available groundwater data exists from 1997 through 2007. The shallow groundwater samples collected in 1997 were not quantitatively evaluated as all of the analytical parameters analyzed and wells sampled in 1997 were sampled again in 1999. The 1999 data were used in the risk assessment, as many of the analytical parameters have not been analyzed for in more recent samples from these same monitoring wells."

Section 7.4.2, Future Lifetime Resident/Industrial Worker:
EPA Comment 18
Although the majority of the contaminants at Site 2 are VOCs, it does not appear that inhalation was looked at for these receptors in the HHRA. This pathway is identified as complete in the CSM (flow chart). Table 1 of Appendix M also states that inhalation of vapors is an issue. Please update the HHRA to include this information or provide and explanation of why this would not be a concern. It is important to evaluate this pathway as a vapor barrier may be needed for any building constructed within 100' of the CVOC plume.

Response: There are currently no buildings on site in order to evaluate current risk from vapor intrusion. The vapor intrusion pathway for future scenarios will be qualitatively evaluated in the risk assessment. The risk assessment already indicates that there are unacceptable risks associated with exposure to groundwater and further action will be necessary for the groundwater. The indoor air pathway will be considered further during the FS in making decisions on future site use and development of remediation levels, if necessary.

Section 9.0 Risk Management Considerations, Page 9-1:
EPA Comment 19
This section states that a subset of COCs were further eliminated from remedial consideration because they are identified as "not site-related or pose minimal risk." The basis of this elimination is not supported by site data. The purpose of the HHRA and ERA was to identify COCs because they are site-related and pose excess risk. If the HHRA and ERA were conducted according to guidance, this qualitative section to further reduce the COCs is unwarranted. If the Navy questions some of the COCs that are shown to pose excess risk then this should be included in the uncertainty analysis section of the HHRA and/or ERA. ((a number of activities could have contributed to the release of PAH's) i.e. open burning of waste, cinder ash burning).

Response: The risk management considerations will be revised based on VDEQ response to comment 4. Because these risk management considerations are not limited to uncertainties in the risk assessment, Section 9, Risk Management Considerations, will remain as a separate section as discussed in partnering.

Comments from EPA TOX, provided 3 July 08.

1. Executive Summary (ES), XI, Combined Surface and Subsurface Soil. The paragraph reads, "Based on the qualitative evaluation of the invalidated saturated subsurface soil samples there are potential risks from TCE, cis-1,2-DCE and VC for a future construction worker, and potentially, although less likely for a future industrial worker or resident, with exposure to subsurface soil." Please explain why a quantitative analysis of subsurface soil is not being performed? In addition, please explain why the subsurface soil samples are not validated? If the subsurface soil samples were not validated then what subsurface soil samples were used to assess risk from the combined exposure to surface and subsurface soils? Since subsurface soil samples were used to assess combined risk (surface and subsurface soils) these same subsurface soil samples should be used to assess risk from exposure to subsurface soil to the construction and industrial workers.

   Response: The subsurface data collected in 2007 were collected to delineate the vertical extent of VOCs in the soil and the majority were collected at depths typically deeper than a human receptor would be exposed to (greater than 10 ft bgs), within the water table. Therefore, they were not validated. The saturated subsurface soil samples will be addressed with the shallow aquifer groundwater. The subsurface soil data used to quantitatively assess risk from the combined exposure scenario were collected during the RI and validated.

2. Section 2.2.1, Historical Land Use, page 2-2. Since previous site history indicate waste ordnance materials were disposed at the site and 1,1,1-trichloroethane (1,1,1-TCA) has been detected in sediment, 1,4-dioxane analysis is highly recommended.

   Response: Because there is risk present in sediment which will be addressed in the FS, collection of additional samples for 1,4-dioxane would not change any remedial alternatives being considered; therefore, additional sample collection is not necessary.

3. Section 5.1.5, Subsurface Soil Sampling, Volatile Organic Compounds, page 5-4. The first paragraph refers to a TCE detection of 12 ug/kg at boring location SJS02-SB06. However this boring can not be located on Figure 5-11? According to Table C-2 this subsurface soil sample was collected on 4/21/99.

   Response: The TCE detection of 12 ug/kg was incorrectly reported as carbon disulfide and the sample collection date was incorrectly reported in the text box for SJS02-SB06 on Figure 5-11. The correct date of collection for SJS02-SB06 is 4/21/99. The text box for SJS02-SB06 will be revised on Figure 5-11.

4. Table 5-5. The table is entitled "Shallow Groundwater" however the reported depths suggest deep groundwater samples. Were these samples used to assess shallow groundwater risk? When comparing these sample identifications with the

Summary of Data Used in Baseline Human Health Risk Assessment (Table 7-1)it is unclear why some of these samples are listed under shallow aquifer groundwater samples (SJS02-MW03S-07B, SJS02-MW04S-07B, SJS02-MW05S-07B, SJS02-MW07S-07B, SJS02-MW08-07B) when they are clearly identified on Table 5-5 as deeper groundwater samples?

Response: The term "shallow groundwater" used in the report refers to groundwater in the shallow Columbia aquifer (begins at 3 to 7 ft bgs and extends to approximately 15 to 25 ft bgs), as opposed to groundwater within the deeper Yorktown aquifer (begins at approximately 50 ft bgs).

5. Section 7.1.1, Data Evaluation and Selection, Data Summary, Soil, page 7-2. EPA recommends further subdivisions of data summary for soils and groundwater to avoid reader confusion. The data summary for soils should be divided into surface soil and subsurface soil while the data summary for groundwater should be divided into shallow and deep groundwater.

   Response: Surface and subsurface soil were discussed together in the data summary because subsurface soil was only evaluated in combination with surface soil. Although there are not subheaders for shallow and deep groundwater under the groundwater data summary, shallow groundwater is discussed in a separate paragraph from deep groundwater. Because the deep groundwater was not quantitatively evaluated in the ERI HHRA, it was not separated out into a stand alone data summary section.

6. Section 7.1.1, Data Evaluation and Selection, Data Summary, Soil, page 7-2. The paragraph reads, "The Expanded RI soil samples were collected to confirm the MIP response and vertically delineate VOCs in the aquifer and not to quantitatively assess risk; therefore, they were not validated. However, two of the soil samples were collected at depths that a receptor could be exposed. One of these samples, SB04 collected from 5.5 to 6.5 bgs, had elevated concentrations of TCE, cis-DCE, and VC." Please indicate where this sample can be located? According to Table 5-2 (Subsurface Soil Detections) and Table C-2, SB04 was collected on 6/25/97 and TCE, cis-DCE and VC were not detected. In addition, subsurface soil quantitative risk evaluations should be performed using the same subsurface soil data that was used to evaluate risk for combined soils (surface and subsurface soils).

   Response: The sample ID referenced should have been reported as SJS02-SB204. The text will be amended to include the correct sample ID. It was assumed that a receptor would not contact subsurface soil alone, and therefore, future scenarios evaluated exposure to combined surface and subsurface soil. During construction activities the construction worker could be exposed to both the surface soil and subsurface soil. Additionally, it was assumed that construction or re-development of the site would result in mixing of the subsurface and surface soil, resulting in contact with both by future receptors. Therefore, quantitative risk evaluation for subsurface soil alone was not performed.

7. Section 7.4.2, Risk Assessment Results, Current/Future Adult Trespasser, page 7-14. The report should provide the Hazard Index (HI) for each evaluated media (e.g., soils, sediment, and surface water). In addition, when RME risk is exceeded, the associated central tendency results should be provided.

   Response: If the HI for a media did not exceed the target risk range, they were not provided in the text but are reflected in the referenced tables. If RME risk is identified, the CTE HI will be provided in the text if there is CTE risk identified. The text references the tables in which the complete results are presented.

8. Section 7.4.2, Risk Assessment Results, Future Adult Resident, page 7-15. Hazard Index and carcinogenic risk should be provided for all media and pathways (ingestion, dermal, vapor intrusion).

   Response: If the HI for a media and/or pathway did not exceed the target risk range, they were not provided in the text but are reflected in the referenced tables. If RME risk is identified, the CTE HI will be provided in the text if there is CTE risk identified. The text references the tables in which the complete results are presented.

9. Table 7-1, Summary of Data Used in Baseline Human Health Risk Assessment, Subsurface Soil. Please explain why the listed subsurface soil sampling data was not used to assess exposure to the construction and industrial workers?

   Response: The combined surface and subsurface soil data were used to assess exposure to construction and industrial workers. As discussed in the risk assessment: The potential future exposure scenarios for soil assume that the subsurface soil will be excavated and mixed with surface soil and placed on the ground surface. Construction workers at the site may be exposed to surface and subsurface soil during excavation activities. Therefore, quantitative risk evaluation for subsurface soil alone was not performed.

10. Table 7-1, Summary of Data Used in Baseline Human Health Risk Assessment, Groundwater. According to Table 5-5 the following samples were not collected at shallow deeps and thus, should not be included within the shallow groundwater data sets; SJS02-MW03S-07B, SJS02-MW04S-07B, SJS02-MW05S-07B, SJS02-MW06S-07B, SJS02-MW07S-07B, SJS02-MW08S-07B. All of these samples were collected from 5/29/07 – 6/12/07 for CVOC analysis only.

    Response: See response to comment 7.

11. Table 7-1, Summary of Data Used in Baseline Human Health Risk Assessment, Groundwater. According to the table sample SJS02-MW10S-07B was collected on 6/12/07 and according to Table 5-5 this sample was collected on 6/6/07. Please correct this discrepancy.

    Response: Sample SJS02-MW10S-07B was collected on 6/6/07. The date on Table 7-1 will be corrected.

12. Table C-1, page 6 of 8. The reported concentration of Aroclor 1260 at sample location SJS17-SS03-000 (2/14/01) is qualified with a "C" please include the definition of this qualifier within the provided legend.

    Response: The "C" qualifier signifies "presence confirmed by GC/MS." This definition will be added to the legend on Table C-1.

13. Table C-2, page 2 of 8. The reported volatile organic concentrations are erroneous and are clearly a laboratory error.

    Response: The concentrations for the soil samples collected in 2007 were incorrectly reported with three additional significant figures. For example, the 14,000,000,000 µg/kg (ppb) should actually be 14,000,000 µg/kg. The associated text, tables, and figures will be amended to reflect the correct concentrations. The conclusions and recommendations of the report will not be affected by the change in concentrations.

<u>RAGS D Table Comments</u>

14. Table 1.0. The Conceptual Site Model identifies Indoor Air as a potential pathway for exposure. However, this pathway is not quantitatively evaluated in the risk assessment. Please include the quantitative evaluation of this pathway.

    Response: There are currently no buildings on site in order to evaluate current risk from vapor intrusion. The vapor intrusion pathway for future scenarios will be qualitatively evaluated in the risk assessment, which will acknowledge that future receptors may be at risk from inhalation of indoor air.

15. Table 2.5, Soil*. According to the table the maximum number of samples for most VOCs and SVOCs is 32 and the maximum number of samples for metals is 35. However, according to Table 7-1, the maximum number of VOCs and SVOCs is 33 samples and the maximum number of samples collected for metals is 36.

    Response: One of the surface soil samples, SJS02-SS14 was inadvertently not included in the screening for combined soil on Table 2.5. Table 2.5 will be updated with this sample. This sample was also not included in the calculation of EPCs for the combined soil COPCs. The EPCs will be re-calculated, and all following tables will be updated.

16. Table 2.8, Groundwater Air. This table is incomplete and does not include all the contaminants that were evaluated based on the contaminants listed as the Chemical of Potential Concern on Table 3.8RME.

    Response: The table will be corrected to include all volatile constituents detected in groundwater.

17. Table 3.5RME, Soil*. The Exposure Point Concentrations (EPCs) could not be

duplicated since the total number of subsurface soil samples could not be determined? According to Table 7-1, there are 23 surface soil samples and 10 subsurface soil for VOCs and SVOC and 13 subsurface soil samples for metals. This equates to a total number of 33 samples for VOC and SVOC and 36 for metals. See comment #12.

Response: See response to Comment 15.

18. Table 3.8RME, Groundwater Air. The Exposure Point Concentrations (EPCs) could not be duplicated since it is unclear what groundwater samples were used to quantify concentrations. See comment #10.

    Response: All of the samples listed on Table 7-1 for shallow groundwater were used to calculate the groundwater EPCs.

19. Table 4.9RME, Deep Groundwater. Please explain why these parameters are provided when deep groundwater was not evaluated?

    Response: Table 4.9.RME inadvertently got carried through to the expanded RI from the RI. It will not be included in the final expanded RI.

20. Table 5.2, Non-Cancer, Inhalation. An incorrect RfD is provided for 1.4-dichlorobenzene. The correct value should be 2.3E-01.

    Response: The inhalation RfD for 1,4-dichlorobenzene will be corrected.

21. Table 7.4 and 7.5RME, Adult and Child Resident, Dermal Absorption. The hazard quotient for mercury, nickel, thallium, and vanadium can not be reproduced. Please provide the ABS value that was used to calculate risk?

    Response: The dermal absorption factors used for soil and sediment will be identified in Section 7.2.4. However, there was a calculation error on Tables 7.4.RME and 7.5.RME and the incorrect RfD (the calculation cells were linked to the wrong RfD cell) was used to calculate the hazard quotient for these metals. These calculations will be corrected.

22. Table 7.4RME, Adult Resident, Dermal Absorption. The hazard quotient for RDX, arsenic, iron, lead, and manganese can not be reproduced. Please provide the ABS value that was used to calculate risk?

    Response: RDX was not a COPC for soil or sediment, and therefore, an ABS was not needed. The ABS for arsenic, iron, lead, and manganese will be identified in Section 7.2.4.

23. Table 7.4RME, Supplement B. Many of the listed Beta (B) values do not agree with the B values provided in RAGS E, September 2001 therefore, the associated DAevent and subsequent risk results could not be reproduced.

Response: The B values will be QC'd and updated as necessary. Additionally, the values from the final version of RAGs E, July 2004 will be used instead of the values from the draft version

24. Table 7.4REME, Supplement D. Please recheck the algorithms used to yield the Calculated Inhalation Exposure (Einh) (mg/kg/shower). Although the Kl(VOC) (cm/hr) and KL (cm/hr) could be reproduced, the Kal (cm/hr), Cwd (mg/l), S (mg/m3-min) and Calculated Inhalation Exposure (Einh) could not be reproduced.

    Response: The Kal algorithm will be corrected.

25. Table 7.5RME, Soil*, Air, Emissions from Soil, Child Resident. The hazard quotient can not be reproduced.

    Response: An incorrect averaging time was used in the calculation. The calculation will be corrected.

26. Table 7.5RME Supplement A. Many of the listed Beta (B) values do not agree with the B values provided in RAGS E, September 2001 therefore, the associated DAevent and subsequent risk results could not be reproduced.

    Response: See response to comment 23.

27. Table 7.5RME, Child Resident, Shallow Groundwater. Although many of the Beta (B) values are incorrect, reported risk was still verified using the B values that were provided. Even when using the reported B values dermal hazard quotient risk results could not be verified although the DAevent value (Supplement A) could be reproduced. Please recheck all algorithms.

    Response: The adult skin surface area was mistakenly used in the calculations. The calculations will be corrected.

28. Table 7.7RME, Soil*, Construction Worker, Dermal Absorption. The hazard quotient for mercury, nickel, thallium, and vanadium can not be reproduced. Please provide the ABS value that was used to calculate risk?

    Response: See response to Comment 21.

29. Table 7.7RME, Shallow Groundwater in Excavation. Dermal Absorption. The hazard quotient for RDX, arsenic, iron, lead, and manganese can not be reproduced. Please provide the ABS value that was used to calculate risk?

    Response: See response to Comment 22.

30. Table 7.7RME, Supplement A. The DAevent for RDX, arsenic, iron, lead, and manganese could not be reproduced.

    Response: The Tevent was mistakenly not used in the calculation. The calculation will be corrected.

31. Table 7.8RME, Soils, Industrial Worker, Dermal Absorption. The hazard quotient for mercury, nickel, thallium, and vanadium can not be reproduced. Please provide the ABS value that was used to calculate risk?

    Response: See response to Comment 21.

32. Table 9.1RME, Sediment, Adult Trespasser. The risk results (carcinogenic and non-carcinogenic) do not agree with the results on Table 7.2RME.

    Response: The risk results shown on Table 9.1RME should agree with Table 7.1.RME, not Table 7.2.RME. The tables will be QC'd and updated as necessary.

33. Section 9.1, Human Health Risk.
    - Although CTE risk can be used to assist with remedial decisions they should never be used solely to risk manage contaminants.
    - Since MW07S and MW10S were consistently identified as the monitoring wells with contaminant exceedances (chloroform, methylene chloride, 2-methylnapthalene, dibenzofuran, naphthalene, and 2,6-dinitrotoluene) these monitoring wells should be further investigated since they are both located within the area of the highest contaminant detections. In addition, semi-volatile contaminants (SVOCs) typically associated with asphalt paving includes benzo(a)pyrene, benzo(a)anthracene, and benzo(b)fluroanthene.
    - Please keep in mind, the use of a single test statistic is not always sufficient when evaluating background data. The most appropriate test statistic to use is typically determined by the data set. Since most environmental data tend to be non-parametric, recommended test statistic for this data generally include Wilcoxin Rank Sum and/or Mann Whitney U-test. These recommended test statistics should be used when risk managing contaminants.

    Response: Comments noted. Risk management considerations will be revised based on comments received from VDEQ, see response to VDEQ comment 4.

Comments from EPA BTAG, provided 15 July 08.

BTAG agrees with the recommendations to conduct a Feasibility Study (FS) to evaluate potential remedial alternatives to mitigate unacceptable human health and ecological risk in soil, sediment, groundwater and surface water at Site 2. It is unclear if there will be one FS (preferred) or one for each of the media. Although not specifically stated, any remedial alternative for surface water will likely involve remediation of soil, sediment and/or groundwater.

Within the FS, an objective to restore the areas impacted by contaminants at the site or from remedial actions should be included. Particular attention should be provided for tidal wetland habitat and associated riparian habitats. Further

evaluation of the hydrological relationships between Site 2 and St. Juliens Creek should be conducted to support the evaluation of remedial alternatives and potential remediation/restoration activities.

Response: One FS is currently being prepared to address all media of concern. Comment noted.