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LETTER AND U S NAVY RESPONSE TO VIRGINIA DEPARTMENT OF ENVIRONMENTAL
QUALITY COMMENTS REGARDING DRAFT FEASIBILITY STUDY FOR SITE 11A JEB
LITTLE CREEK VA
06/01/2011
CH2M HILL



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June 1, 2011

Mr. Paul E. Herman, P.E.
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Virginia Department of Environmental Quality
629 East Main Street, 4th Floor
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Subject: Response to Comments, *Draft Feasibility Study, Site 11a, Building 3033 Former Vehicle Repair Facility and Waste Oil Tank*, Joint Expeditionary Base Little Creek-Fort Story, Joint Expeditionary Base Little Creek, Virginia Beach, Virginia (February 2011 Revision).

Dear Mr. Herman:

On behalf of the Navy, CH2M HILL has prepared the following responses to comments received from VDEQ on the *Draft Feasibility Study, Site 11a, Building 3033 Former Vehicle Repair Facility and Waste Oil Tank*, Joint Expeditionary Base Little Creek-Fort Story, Joint Expeditionary Base Little Creek, Virginia Beach, Virginia (February 2011 Revision).

1. Executive Summary: In the 2nd sentence of the 5th paragraph, please consider replacing the word "provide" with the word "ensure". In the 9th paragraph, if the technical challenge presented by the shallow water table is not easily and inexpensively overcome, why wasn't this alternative eliminated during the screening phase of alternative development if its overall success is questionable?

Response: Revision to the 5th paragraph was made as suggested. Although the shallow water table at the site presents a technical challenge, the language in the text overstates the difficulty in overcoming this challenge for successful implementation of the remedial technology. The last two sentences in the 9th paragraph were revised to read: "Alternative 4 is less implementable because the technology is more difficult to construct and requires increased operation and maintenance of the treatment system. Additionally, because of the shallow water table, successful implementation of this alternative would require the system be operated under a low vacuum pressure to minimize water recovery, potentially resulting in additional maintenance. Consequently, the SVE wells would achieve a smaller radius of influence with some short circuiting to the surface, reducing the effectiveness of the treatment system."

2. Section 2.2: Regarding the 2nd bullet, please ensure it clearly states the goal is to achieve MCLs. The wording should be similar to that used at other groundwater sites. The PRGs listed are for the COCs identified however, the daughter products for the COCs and their respective MCLs should also be identified (but not as PRGs). While they are not currently

present at the site, if they appear during the remediation, their respective MCLs would become applicable ARARs.

Response: The second bullet was revised to read: "Reduce concentrations of COCs in the source area and the downgradient plume to cleanup levels (maximum contaminant levels [MCLs]) through treatment to the maximum extent practicable within a reasonable amount of time."

The following paragraph was added to Section 2.2, Development of Risk-Based Preliminary Remediation Goals:

"Although not identified as site-specific COCs requiring PRGs, the degradation of PCE and TCE may result in temporary increases to the concentrations of daughter products cis-1,2-DCE and vinyl chloride. Even if the site-specific COC concentrations reach cleanup levels (MCLs), Site 11a cannot reach unlimited use and unrestricted exposure until cis-1,2-DCE and vinyl chloride are below the MCL. As a result, these constituents will be monitored during remedy implementation to ensure concentrations remain below their respective MCLs. The daughter product MCLs are as follows:

- cis-1,2-DCE: 70 µg/L
- Vinyl chloride: 2 µg/L"

3. Section 3.2.2, ERD Injection: In the 2nd paragraph, please note the injection layout may need to be modified to avoid utilities. In the 2nd sentence of the 3rd paragraph with regard to the location of the down gradient barriers, please change "east" to "west". Concerning the depth of the injections described in the 3rd paragraph, as there is contamination present in the shallow aquifer, why isn't it being dosed? Please explain how the shallow aquifer contamination will be addressed by the remedy.

Response: The following sentence was added to the 2nd paragraph: "The conceptual design layout as presented in **Figure 3-1** may require modification as a result of existing utilities at the site." The 2nd sentence to the 3rd paragraph was revised as suggested. Injections within the source area (total COC concentrations > 500 µg/L) are designed to target the 18 to 28 feet bgs interval where greater than 90 percent of the contaminant mass is located. The 6th sentence of the 2nd paragraph was revised to read: "Approximately 39,000 gallons of AquaBupH (approximately 1,300 gallons of diluted solution per well) would be injected at a depth of approximately 18 to 28 feet bgs where greater than 90 percent of the contaminant mass is located." Shallow groundwater contamination will be addressed through treatment in the downgradient barrier lines. The 4th sentence of the 3rd paragraph was revised to read: "Approximately 26,000 gallons total of AquaBupH (approximately 1,300 gallons per injection point) would be injected in the downgradient barriers. Dissolved-phase contamination is observed at shallower intervals (approximately 8 to 18 feet bgs) at the leading edge of the plume; however, COCs present in groundwater shallower than 14 ft bgs are isolated. As a result, substrate will be injected at a depth of approximately 14 and 24 feet bgs within the downgradient barrier lines."

4. Section 3.2.2 Monitoring Well Construction: Please note the depth of the well screens in the paragraph. With only one well screen proposed, how will the contamination migration be monitored if it is present across the thickness of the aquifer? Please explain.

Response: The well screen length was revised to 15 feet to monitor contamination in both the deep and shallow portions of the aquifer. The last sentence of the section was revised to read: "The total depth of the monitoring wells would be to the top of the Yorktown confining unit, approximately 28 feet bgs (screen interval from approximately 13 to 28 ft bgs)."

5. Section 3.2.2, Performance Monitoring and Long-term Monitoring: It is VDEQ's concern that the implementation of the remedy and the resulting COC degradation process may impact the current risk status relating to vapor intrusion in the barracks and quarter deck buildings. Please revise the last sentence of the last paragraph to address this concern or explain how the evaluation of building conditions and groundwater concentrations achieve this level of protection of the building occupants.

Response: The last sentence of the last paragraph was revised to read: "To ensure that the potential for vapor intrusion does not increase while COC concentrations remain above PRGs, building conditions will be evaluated during quarterly LTM inspections to ensure new vapor intrusion pathways (i.e. foundation cracks) have not been generated and groundwater concentrations will be evaluated to identify increases in COC and daughter product concentrations that require additional vapor intrusion monitoring (e.g. soil gas and indoor air)." Additionally, the following sentence was added to the end of the last paragraph: "Additionally, LUCs will be implemented to ensure the current residential and industrial building uses are maintained."

6. Section 3.2.3: Regarding the stoichiometric reactions for sodium permanganate, what is the expected impact to the existing levels of manganese in the aquifer due to the addition of this injectate? Post-injection monitoring should include manganese to ensure levels do not exceed MCLs once the reaction is complete and the aquifer stabilizes.

Response: As discussed in the last paragraph of Section 3.2.3, the concentration of manganese in groundwater could increase as a result of the injections however the increases are only temporary and are expected to return to background conditions once the permanganate is depleted. Additionally, the oxidizing conditions created by the injections are expected to transform manganese to predominantly its solid, less soluble form. As noted within the Appendix D cost estimate, total metals, including chromium, lead, arsenic, manganese, and cadmium will be sampled during baseline and performance monitoring. Because increases in these metals concentrations are expected to return to baseline conditions during the performance monitoring period, analysis is not included in Year 5 through 30 LTM, unless Year 5 levels warrant additional sampling. No changes to the document were made.

7. Section 3.2.3, Permanganate Injection: In the 1st paragraph please note the injection layout may need to be modified to address utilities. As with Alternative 2, please explain why only the bottom 10 feet of the aquifer will receive injectate as contamination is present in the upper portions of the aquifer, too.

Response: The following sentence was added after the 1st sentence of the 1st paragraph: "The conceptual design layout as presented in **Figure 3-2** may require modification as a result of existing utilities at the site." Injections within the source area (total COC concentrations > 500 µg/L) are designed to target the 18 to 28 feet bgs interval where greater than 90 percent of the contaminant mass is located. The 5th sentence of the 1st

paragraph was revised to read: "For cost estimating purposes, it was assumed the NaMnO₄ solution would be injected at the bottom of the aquifer, between 18 and 28 feet bgs where greater than 90 percent of the contaminant mass is located, using a bottom-to-top injection approach." Shallow groundwater contamination will be addressed through treatment in the downgradient barrier lines as revised per Comment 3.

8. Section 3.2.3, Performance Monitoring and Long-term Monitoring: It is VDEQ's concern that the implementation of the remedy and the resulting COC degradation process may impact the current risk status relating to vapor intrusion in the barracks and quarter deck buildings. Please revise the last sentence of the last paragraph to address this concern or explain how the evaluation of building conditions and groundwater concentrations achieve this level of protection of the building occupants.

Response: The last sentence of the last paragraph was revised to read: "To ensure that the potential for vapor intrusion does not increase while COC concentrations remain above PRGs, building conditions will be evaluated during quarterly LTM inspections to ensure new vapor intrusion pathways (i.e. foundation cracks) have not been generated and groundwater concentrations will be evaluated to identify increases in COC and daughter product concentrations that require additional vapor intrusion monitoring (e.g. soil gas and indoor air)." Additionally, the following sentence was added to the end of the last paragraph: "Additionally, LUCs will be implemented to ensure the current residential and industrial building uses are maintained."

9. Section 3.2.4, Full-Scale Operation: The 2nd paragraph states the SVE wells are used to "minimize groundwater recover". Isn't the goal to maximize the recovery? In the 1st sentence of the 3rd paragraph please change "east" to "west" and note in the 2nd sentence six horizontal SVE wells will be installed as shown on Figure 3-3. Please modify Figure 3-3 to show the location of the compressor, controls and other equipment on the site and reference the figure in the 5th paragraph. Regarding the vapor-phase GAC to be used to treat the off-gas, how will spent GAC be managed? Please explain. Do the costs reflect the management of this waste material?

Response: The SVE wells are intended to recover soil vapors resulting from the volatilization of COCs in groundwater. Recovery of groundwater into the SVE system has the potential to damage the extraction system, resulting in increased maintenance; therefore, the installation of horizontal wells is designed to minimize the recovery of groundwater while allowing the system to effectively capture soil vapors. No changes to the document were made.

The 1st and 2nd sentences of the 3rd paragraph were revised as suggested. Figure 3-3 was revised to show the approximate location of the AS/SVE treatment system. Additionally, a reference to the figure was added to the 5th paragraph. Waste GAC would be transported as non-hazardous waste to a regeneration facility. The following sentence was added to the end of the 3rd paragraph: "Used GAC would be disposed of as non-hazardous waste at a regeneration facility." Costs for handling the GAC are included in the system O&M cost estimate.

10. Section 3.2.4, Performance Monitoring and Long-term Monitoring: Does AS/SVE produce long-term changes in the aquifer condition such that degradation of COCs continues after active treatment ceases? Please explain.

Response: AS/SVE does not produce long-term changes in the aquifer such that “enhanced” degradation of COCs continues after active treatment ceases. The introduction of oxygen through the AS is contrary to conditions favorable for degradation via reductive dechlorination; however, the groundwater chemistry is expected to return to baseline conditions as upgradient groundwater flushes through the aquifer allowing for natural degradation of COCs over time. LTM will be conducted following the active treatment period to monitor for natural degradation of COCs, as well as the rebound or potential migration of COCs to assess the need for re-start of the AS/SVE system. The last two sentences of the 2nd paragraph under Performance Monitoring and long-term Monitoring were revised to read: “If COC concentrations continue to exceed PRGs after active treatment ceases, then LTM would be conducted semiannually Year 5 through Year 10 and then annually after Year 10 to monitor the natural attenuation of contaminants and assess the need for additional active treatment. For the purpose of this FS, it is assumed re-starting of the AS/SVE system would not be required and COCs were estimated to degrade to below MCLs by Year 30.”

11. Section 3.2.4, Performance Monitoring and Long-term Monitoring: It is VDEQ’s concern that the implementation of the remedy and the resulting COC degradation process may impact the current risk status relating to vapor intrusion in the barracks and quarter deck buildings. Please revise the last sentence of the last paragraph to address this concern or explain how the evaluation of building conditions and groundwater concentrations achieve this level of protection of the building occupants.

Response: The last sentence of the last paragraph was revised to read: “To ensure that the potential for vapor intrusion does not increase while COC concentrations remain above PRGs, building conditions will be evaluated during quarterly LTM inspections to ensure new vapor intrusion pathways (i.e. foundation cracks) have not been generated and groundwater concentrations will be evaluated to identify increases in COC and daughter product concentrations that require additional vapor intrusion monitoring (e.g. soil gas and indoor air).” Additionally, the following sentence was added to the end of the last paragraph: “Additionally, LUCs will be implemented to ensure the current residential and industrial building uses are maintained.”

12. Section 4: In the opening paragraph please add Section 4.2 – Sustainability.

Response: The last sentence of the opening paragraph was revised to read: “Section 4.1 discusses the criteria used to evaluate the alternatives, Section 4.2 discusses the consideration of sustainable practices during alternative evaluation, and Section 4.3 summarizes the evaluations of the alternatives.”

General Response to ARARs comments: Those ARARs determined to be “TBC” or “Not Applicable” have been removed from the tables. Additionally, as a result of comments received regarding air emissions, the following additional changes to ARARs have been made:

Table C-2 – NESHAPs have been removed from the table. 40 CFR 61 were incorrectly cited. Remedial actions are covered by the Site Remediation MACT that can be found at 40 CFR 63.7880 through 7957. 40 CFR 63.7881(b)(2) exempts actions taken under CERCLA. Control of emissions of toxic pollutants is included as Virginia chemical specific ARARs. Therefore, NESHAPs are neither applicable nor relevant and appropriate for this action.

Table C-2 - Ambient Air Quality standards have been removed from this table. The only criteria pollutant reasonably expected to be emitted during this response action is fugitive dust. Control of fugitive dust has been included as an action specific ARAR. Additionally, state rules incorporating EPA NESHAPs have been removed from this table for the reasons that they were removed from the Federal Chemical Specific Table C-1 described above.

Table C-3 – It is not anticipated that Alternative 4 will involve the construction of a major source, therefore attainment and non-attainment area citations were removed from the table.

Table C-4 - The Groundwater Management Act has been removed from the table as not applicable as none of the remedies involved groundwater withdrawal.

Table C-6 – The Air Pollution Control Board Citation was revised to include only fugitive dust as this is the only ambient air pollutant that is reasonably expected to be emitted during the remedial action. Regulations regarding the control of toxic pollutants that could be emitted by the SVE system are included as Virginia Chemical Specific ARARs.

13. Appendix C, Table C-1 Federal Chemical Specific ARARs:

- Clean Air Act – Please spell out “NSPS” in the 2nd Air requirement listed.

Response: ARAR has been removed from Table.

- Safe Drinking Water Act – VDEQ proposes the following language be used in the “Prerequisite” section for 1st groundwater entry, “Groundwater contamination exceeds MCLs. CERCLA requires the return of usable waters to their beneficial use whenever practicable. Based on Virginia’s and EPA’s expectation for beneficial use of groundwater, cleanup to MCLs for the contaminants presenting Human Health Risk is required.”

Response: The following change was made: “Groundwater contamination exceeds MCLs. CERCLA requires the return of usable waters to their beneficial use whenever practicable. Virginia’s expectation for beneficial use of groundwater requires cleanup to MCLs for the contaminants presenting human health risk.”

14. Appendix C, Table C-2 Virginia Chemical Specific ARARs:

- State Water Control Law – The “Groundwater, decontamination water or other materials discharged to surface water” entry should be “Relevant and Appropriate” to address releases to storm sewer drop inlets on or adjacent to the site. This ARAR is necessary to protect from possible discharge of “daylighted” injectate, purge water from wells, etc. to a storm sewer which discharges to surface water via VDES-permitted storm water outfall.

Response Accidental releases are not a planned remedial action; therefore chemical-specific ARARs are not applicable. Prevention of accidental discharges to stormwater drop inlets will be addressed with action-specific ARARs. ARAR has been removed from Table.

- State Water Control Law – The 1st “Surface Water” entry should be “Relevant and Appropriate” to ensure any releases from the site to surface water via storm water outfalls comply with the Virginia Water Quality Standards. Also, this regulation provides for all state waters protection and designated use. “State Waters” are defined as all water, on the surface and under ground, wholly or partially within or bordering the Commonwealth or within its jurisdiction....which affect the public welfare. Va. Code Ann 62.1-44.2 to 62.1-44.34.

Response: Accidental releases are not a planned remedial action; therefore chemical-specific ARARs are not applicable. Prevention of accidental discharges to stormwater drop inlets will be addressed with action-specific ARARs. ARAR has been removed from Table.

- State Water Control Law – The “Groundwater” entry should be revised listing the “Citation” as follows: 9 VAC 25-280-20 to 50 and noting the “ARAR Determination” as “Applicable” (see Table 2-13 of the Site 13 ROD).

Response: The criteria specified are not more stringent than Federal MCLs which have been included as chemical-specific ARARs. ARAR has been removed from Table.

The following ARAR should be added to Table C-2.

- Environmental Health Services – Waterworks Regulation 12 VAC 5-590-440: VDEQ suggest that this regulation be listed as Relevant and Appropriate. Section 440, table 2.3 lists the Virginia Primary Contaminant Levels for Organic Chemicals.

Response: 12 VAC 5-590-440 specific analytical methods to be employed by a waterworks operation and therefore that are not applicable or relevant and appropriate to activities being conducted at Site 11a. Additionally, the criteria specified are not more stringent than Federal MCLs which have been included as applicable chemical-specific ARARs. No changes to Table C-2 were made.

15. Appendix C, Table C-3 Federal Location Specific ARARs:

- Coastal Zone Management Act – VDEQ does not agree that Site 11a is excluded from the coastal zone management act as exempt lands. VDEQ suggest that this regulation be changed to Relevant and Appropriate with the following proposed language located in the Comment section. “If activities at Site 11(a) affect Virginia’s coastal zone, the activities will be consistent to the maximum extent practicable with Virginia’s enforceable policies.”

Response: ARARs are developed only for actions that occur within the site boundaries. Site 11a is land owned and controlled by the federal government and is therefore excluded from the coastal zone by definition [16 U.S.C. § 1453(1)]. Based on this, the Coastal Zone Management Act is neither applicable nor relevant and appropriate for this action. ARAR has been removed from the Table.

16. Appendix C, Table C-4 Virginia Location Specific ARARs:

- Chesapeake Bay Preservation Act – Please revise the citation to read 9 VAC 10-20-120 to 130 and change the “ARAR Determination” to “Relevant and Appropriate” (see Site 13 ROD).

Response: Federal property is not subject to zoning laws. Therefore this requirement is neither applicable nor relevant and appropriate. ARAR has been removed from the Table.

- Endangered Species – While no threatened and endangered species have been found on the site, those species have been found in the vicinity of the site and could forage on the site’s grassy areas. Please change the ARAR determination to “Relevant and Appropriate”.

Response: Endangered species are not present at the site; therefore, this requirement is neither applicable nor relevant and appropriate. ARAR has been removed from the Table.

- Endangered Plant and Insect Species – While no threatened and endangered plant and insect species have been found at the site, those species have been found in the vicinity of the site may become established in the site’s vegetated areas. Please change the ARAR determination to “Relevant and Appropriate”.

Response: Endangered species are not present at the site; therefore, this requirement is neither applicable nor relevant and appropriate. ARAR has been removed from the Table.

17. Appendix C, Table C-5 Federal Action Specific ARARs:

- Safe Drinking Water Act – The underground injection citation should also include 144.51(d)(e)(j)(o).

Response: Section 144.51 does not contain substantive requirements; therefore this section is not applicable. The ARAR was revised to indicate these rules govern the subsurface emplacement of fluids rather than liquids and they are applicable to alternative 4. The ARAR was revised as follows:

- Citation: “40 CFR 144.1(g)(1)(ii), 144.6, 144.12(a) and (c), 144.24(a), 144.82, 144.83, 146.8, 146.10(c)”
- Comment: “These remedial actions will include subsurface injections of fluids using Class V injection wells. Fluids include any material or substance which flows or moves whether in a semisolid, liquid, sludge, gas, or any other form or state. Permits are not applicable to onsite CERCLA injection wells; however, this remedial action will comply with the substantive requirements of the regulation.”

- Clean Air Act – The “ARAR Determination” for Alternative 4 should be “Applicable” to address the vapors generated by the air sparging process.

Response: As discussed in the general response to ARARs comments above, Clean Air Act citations are not applicable and have been removed from the ARARs table.

- Clean Water Act – Storm sewer drop inlets on or immediately adjacent to the site are pathways to surface water bodies. The “ARAR Determination” for this entry should be “Relevant and Appropriate”.

Response: Accidental discharges to stormwater drop inlets will be addressed under Virginia Action Specific ARARs. ARAR has been removed from Table.

18. Appendix C, Table C-6 Virginia Action Specific ARARs:

- Virginia Waste Management Act – The “Solid Waste Management Regulations portion of the “Citation” entry has been repealed. The new citation is 9 VAC 20-81-40 (B)(C), 90, 95, 100.C.

Response: Comment noted. The current ARAR has been revised as follows:

- Action: “Staging of solid waste onsite in containers”
- Requirement: “Establishes criteria for the proper management of solid wastes.”
- Prerequisite: “Management of solid wastes onsite in containers”
- Citation: “Solid Waste Management Regulations, 9 VAC 20-81-45(B) only as it incorporates 40 CFR 257.3”
- Technology: “2,3,4”
- ARAR Determination: “Applicable”
- Comment: “These remedial actions will generate wastes which will be characterized for offsite disposal. Based on site history, all wastes are expected to be characterized as non-hazardous.”

- State Water Control Law – The “VPDES General Permit Regulation for Discharges of Stormwater from Construction Activities” should be “Relevant and Appropriate” as there are storm sewer drop inlets on and adjacent to the site.

Response: The multiple state water control board citations that were listed as relevant and appropriate for protecting the stormwater drop inlets at the site have been removed and replaced with a single applicable ARAR. 9 VAC 25-210-50(A) prohibits the discharge of pollutants to surface water and is applicable to this action since stormwater drop inlets are directly linked to surface water bodies. The new ARAR reads as follows:

- Action: “Staging of chemicals onsite where stormwater conveyances are present.”
- Requirement: “Discharge of pollutants to state waters is prohibited.”
- Prerequisite: “Activities such as dredging, filling, or discharging any pollutant into or adjacent to surface waters, or otherwise altering the physical, chemical or biological properties of surface waters, excavating in wetlands, or conducting the following activities in a wetland:

1. New activities to cause draining that significantly alters or degrades existing wetland acreage or functions.
2. Filling or dumping.
3. Permanent flooding or impounding.
4. New activities that cause significant alteration or degradation of existing wetland acreage or functions."

- Citation: "9 VAC 25-210-50(A)"
- Technology: "2,3"
- ARAR Determination: "Applicable"
- Comment: "Stormwater inlets are present at the site which drain directly to surface water bodies. These inlets will be protected to prevent accidental discharges of treatment chemicals to surface water.

- State Water Control Law – The VPDES Permit Regulation" may also be "Relevant and Appropriate" is a different type of stormwater general permit is in place for the outfall where the nearby drop inlets discharge.

Response: See response to comment above.

- State Water Control Law – The Virginia Pollutant Abatement (VPA) Permit Regulation may be "Relevant and Appropriate" for the proposed alternatives pertaining to IDW or waters that may break through the surface while conducting the remedy.

Response: See response to comment above.

- Environmental Health Services – Please add Private Well Regulations, 12 VAC 5-630-10 to 480. This regulation pertains to the construction of observation, monitoring and remediation wells and well abandonment.

Response: The ARAR was added as follows:

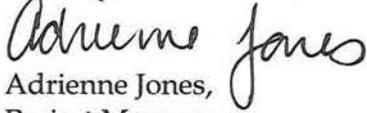
State Board of Health [VA Code Ann. §§ 32.1-12 and 21.1-176 (1992)]

- Action: "Monitoring Well Installation and Abandonment"
- Requirement: "Establishes requirements for the installation and abandonment of observation and monitoring wells, governed jointly by the State Board of Health and Department of Environmental Quality."
- Prerequisite: "Observation and monitoring wells must be properly installed and abandoned in accordance with Virginia regulations to prevent contamination from reaching groundwater resources via the well."
- Citation: "Private Well Regulations, 12 VAC 5-630-420(B),(C), 440, and 450(C)(1),(2),(4),(5), and (7) to (9)"
- Technology: "2,3,4"

- ARAR Determination: "Applicable"
- Comment: "Monitoring wells will be installed and abandoned in accordance with the Virginia regulations."

If you have any questions concerning these responses to comments, please feel free to contact me at (757) 671-6236.

Sincerely,


Adrienne Jones,
Project Manager

cc: Mr. Jeffrey Boylan/ USEPA
Mr. Bryan Peed/ NAVFAC Mid Atlantic
Ms. Cecilia Landin/CH2M Hill