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NSWC INDIAN HEAD, MD  
SSIC 5000-33a

**RESPONSES TO COMMENTS REGARDING DRAFT ENGINEERING  
EVALUATION AND COST ANALYSIS AND DRAFT ACTION MEMORANDUM  
SITE 67 HOG OUT AREA NSWC INDIAN HEAD MD**

07/31/2019  
TETRA TECH

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**DATE:** July 29, 2019  
**TO:** Indian Head Installation Restoration Team  
**FROM:** Tetra Tech  
**SUBJECT:** **Responses-To-Comments (RTCs)**  
***Draft Engineering Evaluation and Cost Analysis (EE/CA) and Draft Action Memorandum for Site 67–Hog-Out Area (Tetra Tech, 2019)***  
Naval Support Facility Indian Head (NSFIH), Indian Head, Maryland  
CLEAN Contract No. N6247016D9008, Contract Task Order JU01

Internal Navy comments on the *Draft EE/CA* and *Draft Action Memorandum for Site 67–Hog-Out Area* from the Navy Washington RPM, NSFIH POC and Natural Resources, and NAVFAC Atlantic Quality Document Review (QDR) were received and incorporated.

Mr. Curtis DeTore, RPM from the Maryland Department of Environment (MDE), provided comments via phone on July 18, 2019. Technical reviewers from EPA Region 3 provided comments care of emails from Mr. Rob Thomson (EPA RPM) on July 15, 2019, as follows:

- Mr. Nathan Doyle (Hydro) comments dated July 10, 2019
- Ms. Katie Matta (Eco) comment dated July 11, 2019
- Mr. Martin Gehlhaus (Tox) comments dated July 15, 2019

The comments and responses are provided below.

## **COMMENTS FROM MDE**

**MDE Comment 1:** General: Please explain in the text why some of the excavation areas are located outside the IR site boundary.

**Response:** The IR site boundary is established when the site is initially identified and before the extent of contamination is defined fully. The Navy will change the definition of this boundary in the legend to Approximate IR Site Boundary in respective figures.

**MDE Comment 2:** Executive Summary, Page ES-1: Describe why hazardous disposal in a Subtitle C landfill will not be required for any corrosive wastes?

**Response:** Any excavated materials or other construction-derived waste will be characterized prior to off-site disposal. Materials that are found to be hazardous by corrosivity characteristic will be treated onsite similar to the on-site lead stabilization treatment planned for the removal actions at the Small Arms and Skeet Ranges (SASRs) on the Stump Neck Annex.

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**MDE Comment 3:** MDE suggests removing the RAO addressing corrosivity. This may be best handled during the groundwater remedy. The soil removal action is based on exceedances of cleanup levels for human health risk and mostly for ecological risk. This will alleviate some of the EPA comments received on the EE/CA and Action Memo regarding the same matter.

**Response:** Agree. Also see Response to EPA Hydro Comment 1. The Navy proposes removing the last RAO, “Remove Unloading Area soil that is hazardous by RCRA characteristic for corrosivity-toward-steel.” References to this activity will be removed from the EE/CA and the Action Memo. Excavated materials still will be characterized prior to off-site disposal (and treated on-site accordingly) during the removal action. Optional backfill amendment can be reconsidered by the Team as an informal improvement of the environment (aquifer) during development of the Removal Action Work Plan (RAWP). Regardless, the Navy will address corrosive portions of the aquifer as needed during the eventual groundwater remedy.

**MDE Comment 4:** Section 3.3–RAOs: Make the wording of the RAOs consistent between Section 3.3 and the Executive Summary.

**Response:** The RAOs will be checked for consistency between Section 3.3 and the Executive Summary. Note the corrosivity RAO (fourth RAO in bulleted lists) will be removed (see Response to MDE Comment 3).

**MDE Comment 5:** Section 4.2.1–Description, subsection Confirmation Sampling, Page 4-5: Why are bottom verification samples not included for the 1-foot-excavations?

**Response:** The 1-foot-deep excavations of soil and sediment (with backfill and restoration) will mitigate ecological risk in the 0 to 1-foot soil interval. Zinc concentrations in soil deeper than 1 foot in this case are not a concern for ecological receptors. The excavation to occur in the Unloading Area / test pits location will mitigate human health risk. This deeper excavation likely will extend to the groundwater table, obviating bottom verification samples; however, the EE/CA describes that bottom verification samples are needed if the excavation in the Unloading Area does not extend to the water table. Note that side-wall / horizontal verification samples are required for all of the excavation areas.

**MDE Comment 6:** Figure 2-8: The symbols for ‘saltwater valve point’ and ‘water junction point’ do not appear on the figure. Suggest remove from the legend.

**Response:** The subject items will be deleted from the legend.

**MDE Comment 7:** Figure 2-11: Suggest removing ‘Facility Boundary’ from the legend and changing the description of the red site boundary to ‘Approximate IR Site Boundary’ (or equivalent).

**Response:** The figure will be edited as suggested.

**MDE Comment 8:** Figure 2-12: ‘Water junction point’ should be removed from the legend (not used in figure).

**Response:** The subject item will be deleted from the legend.

**MDE Comment 9:** Figure 2-13: Site boundary definition in legend references Site 70. The red site boundary is off-color on the figure due to the yellow shading of the perchlorate plume. Add stormwater lines to legend, but do not make them the same purple color as the Installation Boundary.

**Response:** The legend entries and features on the figure will be fixed.

**MDE Comment 10:** Figure 3-2: Shaded areas are not defined in legend and are not explained otherwise.

**Response:** The Target Removal Areas will be explained on the figure.

**MDE Comment 11:** Figure 4-1: Shaded areas are not defined in legend. Stormwater lines and drop inlets/junctions are not defined in legend.

**Response:** The Target Removal Areas and stormwater features will be explained on the figure.

## COMMENTS FROM EPA HYDROGEOLOGIST

**EPA Hydro Comment 1:** Action Memo, Section II, A, 1 - Removal Site Evaluation, Page 2: The third paragraph states that unacceptable risks to human health exists in groundwater, and that acidity of the aquifer matrix soils will in the unloading area will be addressed in part by the NTCRA. Since the NTCRA purpose is to “reduce or eliminate potential risks to human health, welfare, and the environment posed by contaminated soil and sediments in stormwater utility system, upland soils, and Mattawoman Creek sediment,” additional detail should be given for this NTCRA activity.

The neutralization of acidic aquifer conditions through a lime amendment in the excavation would seem to be out of scope for the NTCRA’s stated purpose. Additional information should be given to support this activity by demonstrating this part of the removal’s contribution to, and consistency with, any future long-term remedies. This will require a short discussion on any potential future groundwater remedies. Several alternatives may need to be briefly discussed since the RI/FS has not been completed and no remedy for groundwater has been chosen.

**Response:** The addition of an aquifer buffering amendment to the excavations before backfilling is in consideration of low aquifer pH levels in some areas and RCRA waste characterization results—from some of the soil and aqueous investigation-derived wastes (IDW) during the RI—indicating corrosivity toward steel at an unacceptable rate (hazardous). The placement of, e.g., crushed limestone into the upland soil excavations prior to backfilling would be beneficial to the groundwater environment (i.e., the aquifer matrix soils). Ultimately, the Partnering Team discussed this as a proactive measure by the Navy in anticipation of a multitude of groundwater remedial technologies to be evaluated in the FS. There are few scenarios where a corrosive aquifer is suitable for in situ treatment of these groundwater COCs.

Based on a related comment from MDE (see Response to MDE Comment 3), the Navy will remove the last RAO, “Remove Unloading Area soil that is hazardous by RCRA characteristic for corrosivity-toward-steel.” References to this activity will be removed from the EE/CA and the Action Memo. Therefore, this comment is overcome, and a discussion of potential groundwater remedial alternatives is not needed in the EE/CA.

**EPA Hydro Comment 2:** Action Memo, Section III, B - Threats to Public Health or Welfare, Page 6: This section outlines the presence of PAHs and metals contaminants at concentrations unacceptable to human exposure as the threat posed by the Site to public health or welfare, as well as potential migration caused by weather events. The section goes on to state that these risks will be mitigated by removing the contaminated soils, with risk-based clean-up levels.

One of the attainment criteria to achieve the RAOs is listed as removal of soils determined to be RCRA characteristic waste, corrosive toward steel. This statement should be removed. Soils are being removed

based upon COC concentrations. The removal of corrosive soils is a secondary effect of the removal due to COC concentration. Additionally, the RCRA characteristic of corrosivity is only applied to liquid and aqueous solid waste and may not be applicable to the excavated soil (40 CFR section 261.22).

**Response:** Overcome by Responses to MDE Comment 3 and EPA Hydro Comment 1. The respective RAO and the lime amendment activities will be removed from the EE/CA and the Action Memo.

**EPA Hydro Comment 3:** Action Memo, Section V, A - Proposed Actions, Page 7: The last RAO, concerning removal of soil with the RCRA characteristic of corrosivity should be removed, unless the Navy intends to remove these soils regardless of COC concentrations. Since the NTCRA is being proposed based upon removal of COCs above human health or ecological risk concentrations, the removal of the corrosive soil is a secondary benefit.

Additionally, I do not believe that this characteristic is applied to solids. Additional research may be warranted. This comment also applies to the RAOs as presented in the EE/CA.

**Response:** The RAO will be removed (see Responses to MDE Comment 3 and EPA Hydro Comment 1).

**EPA Hydro Comment 4:** Action Memo, Section V, A, 2 - Contribution of Remedial Performance, Page 9: This would be a good section to discuss the proposed lime amendment to the backfilling operations to address aquifer acidity and link the NTCRA to a future remedial action for groundwater. The removal of contaminated soils will also stop any potential future migration of COCs from soil to the groundwater.

**Response:** Lime amendment discussion is overcome by Responses to MDE Comment 3 and EPA Hydro Comment 1. Navy proposes adding text describing the reduction in migration as follows:

Additional sampling will refine the excavation limits prior to completing the removal action. [The removal of contaminated upland soils will reduce the potential for future migration of COCs from soil to groundwater. The removal of contaminated sediments from the stormwater system will reduce the potential for future migration of COCs via discharge to the Creek.](#) Excavation of the contaminated soils and sediments...

## COMMENT FROM EPA'S BIOLOGICAL TECHNICAL ASSISTANCE GROUP (BTAG)

**EPA Eco Comment 1:** I have reviewed the subject document and agree with the recommendation of Alternative 2 – Excavation and Off-Site Disposal. This alternative meets the Remedial Action Objectives, which include reducing unacceptable risks to ecological receptors from exposure to zinc in surface soil and sediment. This alternative also provides for unrestricted use and unlimited exposure for the soil and sediment media.

**Response:** Agree. No changes are associated with this comment.

## COMMENTS FROM EPA'S HEALTH SCIENTIST

Comments from EPA's toxicology technical reviewer also include  *cursory*  comments on the human health risk assessment (HHRA) section of the Draft Remedial Investigation (RI) Report for Site 67 (draft version in July 2019), which directly relate to the subject EE/CA review. Therefore, these cursory comments and cursory responses are included herein.

**EPA Tox Comment 1:** General comment on the Draft HHRA section from Draft RI and on the Draft EE/CA: The calculation of Remediation Goals in soil must also consider groundwater risks to be certain that target organ risk to the receptor is acceptable. For example, if the RGs for COCs in soil that affect the cardiovascular system are based on an HI of 1 and the RGs for the same COCs in groundwater are based on an HI of 1, the target organ risk for the receptor when exposed to both media will exceed unity and present unacceptable risk. For Site 67, it appears that Al, As, Ca, Co, Cu, Fe, Li, and Mn are COCs in both soil and GW for the child resident.

**Response:** The PRG tables were added into the HHRA section of the RI to support EPA's review of the EE/CA. The PRGs are calculated based on the intended path forward for the site. As indicated in RAGS, Vol. 1, Part A and Part B, one must consider the likelihood that the same individuals would consistently face the reasonable maximum exposure of each medium or by more than one pathway when calculating risks and determining appropriate PRGs. In this case, the site is industrial/military now and for the foreseeable future, but residential scenarios are evaluated for risk management purposes. The shallow groundwater cannot be used for drinking water in Maryland, and the most problematic soil for human health will be excavated by the subject removal action. The soil PRGs apply only to the Unloading Area (or "Test Pit Soils") exposure unit. The HHRA determined there are no unacceptable risks from the soil exposure unit outside of the Unloading Area. Excavating the soil in the Unloading Area addresses the unacceptable human health risks from soil at the site. Therefore, the Navy considers the PRGs to be adequate in this case. Navy proposes no changes associated with this comment.

**EPA Tox Comment 2:** HHRA, Page 6-26, Section 6.4.3 – This section provides the cancer and noncancer results from the human health risk assessment. The risks are provided for test-pit soils, unloading area groundwater, and Hog-Out area groundwater separately, but does not provide the risks for the receptors exposed to each of the media. For example, a future resident is exposed concurrently to soil, test-pit soil, and groundwater, but the risks were not evaluated in this manner. In the RAGS Part D Table 9s, recommend evaluating the risks for the receptors exposed to multiple media instead of evaluating media-specific risks. Evaluating risks based on concurrent exposure to site media may result in additional COCs.

For example, benzo[a]pyrene and dibenz[a,h]anthracene contribute cancer risks from exposure to surface soil (B[a]P cancer risk of 4E-6) and subsurface soil (B[a]P cancer risk of 1E-5 and dibenz[a,h]anthracene cancer risk of 3E-6) that are in excess of the 1E-6 benchmark applied to identify COCs. However, the list of COCs on page 2-7 in the EE/CA does not include either PAH.

**Response:** The risks were evaluated in the HHRA for combined exposure to the multiple soil and groundwater exposure units as indicated in HHRA/Draft RI Section 6.2.4–Exposure Point Concentrations. Note the "test pit soils" in the Unloading Area were evaluated as a separate soil exposure unit from site-wide soil exposure units in the RI. This was due to the elevated metals concentrations measured and soil staining observed during the trenching activities, and more importantly due to the knowledge that human health risks from soil in the Unloading Area would be addressed by the subject removal action. Human receptors ultimately will not be exposed to every exposure unit of every medium. Also see Response to EPA Tox Comment 1. Benzo(a)pyrene and dibenzo(a,h)anthracene are included in the list of COCs on page 2-7 of the EE/CA for the "Test Pit Soils" environmental medium. The HHRA determined exposures in other site-wide soil is within EPA's acceptable risk ranges. Navy proposes no changes associated with this comment.

**EPA Tox Comment 3:** HHRA, Page 6-39, Section 6.7 – Recommend deleting sentences describing/referencing RGOs: this is extraneous information.

**Response:** Understood. The intent is to introduce a reason for calculating and presenting PRGs in the RI report (atypical in Region 3). This comment will be addressed with review and finalization of the RI report.

**EPA Tox Comment 4:** HHRA, Table 6-30 – Please clarify in the document how the PRGs were calculated. Were the PRGs pulled from the RSL tables or were they calculated using the calculated human health risks (i.e.  $EPC/site\ risk = PRG/target\ risk$ ).

**Response:** The PRGs were calculated using equations from RAGS, Vol. 1, Part B (typical). A footnote will be added to corresponding Table 3-5 in the EE/CA. The comment will be addressed in the HHRA during review and finalization of the RI report.

**EPA Tox Comment 5:** HHRA, Table 6-31 – Please clarify the target organ for cobalt as the thyroid. For cobalt in soil (table 6-30), the target organ is the thyroid, but in the groundwater table (6-31) the target organ for cobalt is the endocrine system.

**Response:** Understood. Instances of endocrine system will be changed to thyroid for cobalt. The thyroid is one gland of the endocrine system.

**EPA Tox Comment 6:** EE/CA, Page ES-1 – Please clarify the fourth RAO. How do soils characterized as RCRA characteristic wastes require cleanup under CERCLA? Generally, soils are removed because they present unacceptable risk, and the RCRA characteristic waste is an ARAR applied to the excavated soil.

**Response:** This comment is overcome by the Responses to MDE Comment 3 and EPA Hydro Comment 1.

**EPA Tox Comment 7:** EE/CA, Page 2-7, last paragraph – Delete the section of the paragraph discussing lead in groundwater. Because this EE/CA addresses soil, conclusions related to GW are inappropriate.

**Response:** The respective section of the paragraph will be deleted.

**EPA Tox Comment 8:** Page 3-4, first paragraph, second sentence – The statement that “there are no unacceptable human health risks from exposure to contaminants in... soil elsewhere on the site” is incorrect. If the risks are evaluated based on receptor exposure to soils and groundwater concurrently, aluminum is a soil COC for the construction worker and benzo[a]pyrene and dibenz[a,h]anthracene are COCs for the lifetime resident. Additional COCs will be added to the table on page 2-7 based on this analysis.

**Response:** Understood. This is overcome by the Response to EPA Tox Comments 1 and 2. The Navy proposes revising the sentence as follows to be clearer:

Human health risks in soil need to be addressed ~~only~~ in the Unloading Area. [The HHRA determined no unacceptable risks in the soils outside of the Unloading Area \[exposure unit\].](#) There are no unacceptable human health risks from exposure to contaminants in creek sediments ~~or in soil elsewhere at the site~~. Unacceptable human health risks for groundwater will be addressed separately from this NTCRA.

**EPA Tox Comment 9:** EE/CA, Table 3-1 – Remove CSFs and RfDs from this table. Cancer slope factors and reference doses are not TBCs. They are toxicity values applied in the calculation of screening values and human health risk assessments.

**Response:** Navy disagrees because CSFs and RfDs are TBCs that can be used directly in the formulas to calculate risk-based remediation goals at specified target risk levels (see RAGS, Vol. 1,

Part B–Development of Risk-Based PRGs). Navy proposes no changes associated with this comment.

**EPA Tox Comment 10:** EE/CA, Table 3-1 – Recommend consultation with Maryland RPM as Maryland House Bill 1233 appears to lower the elevated blood lead level to a reference level as determined by the CDC (5 µg/dL). If applicable, Maryland House Bill 1233 would be an ARAR and the cleanup goal for lead in soil would be impacted.

**Response:** Understood. The Team discussed this issue during a conference call on July 18, 2019. MDE indicated that removal or remedial actions using the child blood lead level of 10 µg/dL completed before July 1, 2020,<sup>1</sup> that allow for UU/UE for the medium will be compliant. The Team agreed the respective medium or site would not be reopened for reevaluation under the lower value (if construction is completed before the value is enforced). Note the change to the lower blood lead level of 5 µg/dL impacts only the residential child cleanup levels calculated or modeled using the new value. Therefore, propose no changes associated with this comment.

**EPA Tox Comment 11:** EE/CA, Table 3-5 – As previously commented, the calculation of Remediation Goals in soil must also consider GW risks to be certain that target organ risk to the receptor is acceptable.

**Response:** Navy disagrees as indicated in Response to EPA Tox Comment 1. Navy proposes no changes to the document or removal action approach associated with this comment.

**EPA Tox Comment 12:** EE/CA, Table 3-5 – Remove the calculation of cancer RGs for the construction worker, as the cancer risk was within acceptable risk ranges for the construction worker.

**Response:** Agree. It is noted that this change does not impact the overall selected cleanup levels.

**EPA Tox Comment 13:** EE/CA, Table 3-5 – Remove the calculation of cancer RGs for the child resident, as cancer risks are estimated for the lifetime resident.

**Response:** Agree. It is noted that this change does not impact the overall selected cleanup levels.

**EPA Tox Comment 14:** EE/CA, Table 3-5 – Remove the calculation of noncancer RGs for the lifetime resident. Noncancer risk is considered for child and adult residents but not for lifetime residents.

**Response:** Agree. It is noted that this change does not impact the overall selected cleanup levels.

**EPA Tox Comment 15:** EE/CA, Table 3-5 – The concentration of benzo[a]pyrene at a 1E-5 cancer risk is 1.1 mg/kg and apportioned to 0.367 mg/kg.

**Response:** Agree. The PRG will be corrected.

**EPA Tox Comment 16:** EE/CA, Figure 2-9 – Remove phenanthrene from the figure. The RSL for phenanthrene in the HHRA is based on pyrene, which has a soil RSL of 180 mg/kg.

**Response:** Agree.

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<sup>1</sup> HR 1233 indicates Maryland will enforce the revised/lower child blood lead level starting on July 1, 2020.



**EPA Tox Comment 17:** EE/CA, Figure 2-9 – Recommend replacing the RSLs in the table with the remediation goals. The RSLs based 1E-6 and HQ of 0.1 have no bearing on the removal areas provided in Figure 4-1.

**Response:** Agree.

**EPA Tox Comment 18:** EE/CA, Figure 3-2 – Recommend soil removal at soil sample location S17 based on exceedance of benzo[a]pyrene and dibenz[a,h]anthracene remediation goals.

**Response:** Also see Responses to EPA Tox Comments 1 and 2 regarding exposure units evaluated in the HHRA. The HHRA determined risks above EPA’s acceptable risk ranges from exposure to soil only in the test pits / Unloading Area exposure unit. There are no unacceptable human health risks in soil outside of this area. The human health cleanup levels for soil apply only to the Unloading Area. Therefore, Navy proposes no changes to the document or removal action approach associated with this comment. In addition to this, consider the following:

- The Navy plans to excavate more than 1,000 cubic yards of soil in the Unloading Area (Target Removal Area 9) due to PAHs and metals.
- Location S17 is in the woods near the facility boundary and the creek, not in the Unloading Area. The exceedances of the Unloading-Area-PAH-cleanup levels in surface soil at location S17 are isolated, with no exceedances in subsurface soil at S17 nor in all surrounding surface soil samples (i.e., locations S12 through S16, S18, and S19).
- The concentrations of these PAHs at location S17 do not indicate a hot spot. The concentration of benzo(a)pyrene in surface soil at location S17 is 2.6 mg/kg, above the [corrected per EPA Tox Comment 15] risk-based, apportioned cleanup value of 0.367 mg/kg (TCR =  $10^{-5}$ ). The concentration of dibenzo(a,h)anthracene is 0.54 mg/kg, also above the risk-based, apportioned cleanup level of 0.367 mg/kg (TCR =  $10^{-5}$ ).
- The estimated half-lives for benzo[a]pyrene are less than 1 to 6 days in the atmosphere, less than 1 to 8 hours in water, 5 to 10 years in sediment, and greater than 14 to 16 months in soil (for complete degradation) (EPA, 1984).<sup>2</sup> The concentrations of the PAHs at S17 are expected to degrade further over time.
- Clearing will temporarily damage the environment at location S17, and excavation and backfill with diesel-fueled equipment will generate more PAHs in the area.

**EPA Tox Comment 19:** Action Memo: Recommend the addition of a table presenting the RGs.

**Response:** Agree.

**EPA Tox Comment 20:** Action Memo, Table 1: As previously stated, cancer slope factors and reference doses are not TBCs. Remove CSFs and RfDs from the table.

**Response:** Navy disagrees as discussed in Response to EPA Tox Comment 9. Propose no changes associated with this comment.

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<sup>2</sup> United States Environmental Protection Agency (EPA). 1984. Health Effects Assessment for Benzo(a)pyrene. Prepared by the Environmental Criteria and Assessment Office, Cincinnati, OH, for the Office of Emergency and Remedial Response. EPA/CIN-HO22.

**EPA Tox Comment 21:** Action Memo, Table 1 – If applicable, Maryland House Bill 1233 would be an ARAR and the cleanup goal for lead in soil would be impacted.

**Response:** Overcome by Response to EPA Tox Comment 10. Propose no changes associated with this comment.

**EPA Tox Comment 22:** Action Memo, Figure 4 – Recommend soil removal at soil sample location S17 based on exceedance of benzo[a]pyrene and dibenz[a,h]anthracene remediation goals.

**Response:** Overcome by Response to EPA Tox Comment 18. Navy proposes no changes associated with this comment.