

Response to Comments Draft Remedial Investigation UFP-SAP, Military Munitions Response Program Site UXO-28 Marine Corps Base Camp Lejeune, North Carolina

PREPARED FOR: Dave Cleland, NAVFAC Mid-Atlantic
Charity Delaney, MCB Camp Lejeune
Thomas Richard, MCB Camp Lejeune
Jennifer Tufts, USEPA Region 4
Randy McElveen, NCDEQ

PREPARED BY: CH2M HILL, Inc.

DATE: October 18, 2016

Introduction

The purpose of this document is to address comments on the Draft UXO-28 Remedial Investigation UFP-SAP. The United States Environmental Protection Agency (USEPA) and North Carolina Department of Environmental Quality (NCDEQ) comments are listed below. Responses to comments are provided in bold.

USEPA Comments (dated September 27, 2016)

1) Worksheet #10 – Conceptual Site Model, Pages 31 and 33:

- a) Constituents of Concern, on page 31 identifies perchlorate and explosives residues as the COCs for UXO-28. Metals should also be identified as potential COCs based on their likely presence in MEC/MPPEH, such as aluminum, antimony, copper, lead, magnesium and zinc. The PA/SI indicated that lead and arsenic were the only metals that exceeded background and screening criteria. However, only a handful of surface soil and sub-surface soil samples (~8 of 200 samples) were evaluated for total metals in the PA/SI. Metals associated with MEC/MPPEH should be included in sampling efforts unless adequate justification is provided for not analyzing metals in soil samples.

Response – As discussed in the approved PA/SI, total metals in surface and subsurface soil at UXO-28 have been previously investigated and it was determined that arsenic was the only metal constituent (besides lead) to exceed background and other screening criteria. Because arsenic does not pose an unacceptable risk to human health or ecological receptors and lead was addressed during the NTCRA and will be evaluated and summarized in the Site UXO-23 NTCRA Summary Report and Site UXO-23 RI, it was recommended that the UXO-28 RI sampling focus on explosives residues and perchlorate. However, if MEC items with leaking filler are identified during the intrusive anomaly investigation or explosives residues are detected in soil in excess of project action levels, additional metals sampling will be considered for soil and an addendum to the UFP-SAP will be prepared.

- b) The CSM notes that contaminated soil particulates, if present, could be transported via wind or soil-disturbing activities to surrounding terrestrial areas and/or surface water bodies. However, Worksheet #11 proposes to sample surface water and sediment only if a Sampling Unit (SU) adjacent to surface water bodies exceeds risk. It is recommended that sediment and surface water samples are collected from wetlands, creeks and drainage ways to assess potential contamination in water bodies from multiple migration pathways, such as overland flow, wind transport, and groundwater discharge.

Response – During the UXO-23 PA/SI (CH2M HILL, 2010), five surface water and sediment samples were collected from Bearhead Creek for PAH, perchlorate, and total RCRA metals analyses. Human health risk screenings did not identify unacceptable risks from surface water or sediment exposure. Ecological risk screenings identified potential unacceptable risks associated with lead and selenium concentrations in Bearhead Creek sediment. However, there is no known source of selenium at the Skeet Range and concentrations increased from upstream to downstream locations; therefore, it was assumed that selenium may have originated from an upstream source or may be naturally elevated in the creek. Perchlorate was not detected in any surface water or sediment samples. As part of the UXO-23 RI sampling in 2012 and 2013, to further evaluate potential unacceptable risks identified from lead in the PA/SI, 50 sediment samples were collected from Bearhead Creek for lead analyses. Additionally, to evaluate Beaver Dam Creek, 16 sediment and 6 surface water were collected for PAH and lead analyses. Human health and ecological risk assessments will be conducted and summarized in the UXO-23 RI Report. However, if explosives residues are detected in excess of project action levels in surface soil or groundwater, additional surface water and sediment sampling for explosives residues will be considered to address the potential transport pathways and an addendum to the UFP-SAP will be prepared.

- c) Nature and Extent, on page 31 states that further evaluation of perchlorate in groundwater is not warranted. Given the high solubility/high mobility of perchlorate, it is possible sources of perchlorate have leached and are no longer present in soils, but remain in groundwater. Please add perchlorate as a constituent that will be analyzed in groundwater samples.

Response – During the UXO-23 PA/SI (CH2M HILL, 2010), groundwater samples were collected from five temporary wells for the analysis of PAHs, perchlorate and total RCRA metals. Perchlorate was not detected in any of the groundwater samples. However, perchlorate sampling will be added to the upcoming groundwater sampling event planned for 12 wells located site-wide in November/December 2016 as part of the UXO-23 RI in accordance with the UXO-28 RI SAP. Perchlorate results will be presented in the UXO-28 RI. The text will be revised to reflect this.

- 2) Worksheet #11 – Project Quality Objectives/Systematic Planning Process Statements, Pages 35 through 39:
- a) The second bullet of Question 1, on page 35 provides the rationale for selection of SUs for ISM sample collection. This approach is reasonable based on current information. It is recommended that the SUs be adjusted, or additional SUs be considered, if the DGM survey identifies areas with high densities of MEC/MPPEH which could be potential source areas.

Response - Concur. If the DGM survey identifies areas with high densities of MEC/MPPEH, additional SUs will be considered. The text will be revised to reflect this.

- b) The third bullet of Question 1, on page 35 describes the proposed approach for determining whether additional sampling will be conducted, which is contingent upon the results of screening level risk assessments and/or full risk assessments. Please include the proposed methodologies for the screening level and full human health and ecological risk assessments, the Explosive Hazard Assessment and the MEC Hazard Assessment. It is unclear if data from each SU, or each cell within an SU, will be evaluated separately, or if the data from all SUs will be combined and the entire UXO-28 will be considered a single exposure unit. Please provide a description of the risk assessment approach.

Response – The text in Worksheet 11 will be updated to include descriptions of the approach for human health risk, ecological risk, and MEC hazard assessments. The third bullet of Question 1/Worksheet 11 will be revised to clarify the SU data evaluation approach as follows:

Further refinement of the lateral extent of explosives residues and/or perchlorate may be warranted if the average of the triplicate ISM soil sampling results exceed the North Carolina Soil Screening Levels (NC SSLs), USEPA Residential or Industrial Regional Screening Levels (RSLs), and/or ecological screening values (ESVs). If an SU triplicate average result exceeds the RSL and/or ESV, a human health risk screening (HHRs) and/or ecological risk screening (ERS) will be conducted for that SU, followed by full risk assessments if potential unacceptable risk is indicated from the screening. If risk assessment results indicate potential unacceptable risk to site receptors, or if the triplicate average exceeds NC SSLs, additional surface soil sampling shall be conducted to refine the extent of contamination within that SU.

- c) The fourth bullet of Question 1, on page 36 describes the proposed approach for vertical delineation of contaminants. Please provide rationale for a maximum of 11 subsurface soil borings, and also provide the depth intervals to be sampled.

Response – References to the ‘maximum of 11 subsurface soil borings’ will be removed from the text. The text will be revised to state that four subsurface soil samples shall be collected one foot above the water table within each grid cell that poses unacceptable risk or contains concentrations of constituents exceeding the NC SSLs. The subsurface soil sample locations shall be evenly distributed across the grid cell.

- d) The fourth bullet of Question 1, on page 36 indicates that groundwater will only be assessed if the following criteria are met: 1) if unacceptable risk is indicated from risk assessments for exposure to perchlorate in subsurface soil, or 2) if explosive residues results exceed the NC SSLs. This approach does not consider the possibility that perchlorate has already leached from soil to groundwater, as it does not readily adsorb to soil. Given previous detections of perchlorate at the site as part of the UXO-23 investigations, perchlorate should be assessed in groundwater regardless of it is found in soil. Also, locations for groundwater sampling locations should consider the results of the DGM survey (i.e., types of MEC found, high density areas, etc.).

Response – See response to comment #1c.

- 3) Worksheet #14 – Summary of Project Tasks, Pages 49 through 60:

- a) Post-Detonation Soil Sampling, Page 58 – Proposed analysis for post-detonation soil samples is limited to explosives residues. Other potential COCs such as metals and perchlorate should be evaluated or please provide rationale for their exclusion.

Response – An evaluation of post-detonation sampling results at MCB Camp Lejeune was conducted based on the results of over 300 post-detonation samples collected to-date for explosives residues, perchlorate, and metals analyses (CH2M HILL, 2015). No detections of perchlorate exceeded regulatory screening criteria and metals results did not exhibit patterns indicative of environmental impacts related to the detonations. As such, it was recommended, and agreed to by the Partnering Team, that future post-detonation samples be analyzed for explosives residues only.

4) Worksheet #15-1 and 15-2 - Reference Limits and Evaluation Tables - Site UXO-28, Page 61 and 62:

- a) Please clarify which of the potential screening levels will be used as the PAL for the nature and extent evaluation by highlighting on the worksheet. If different PALs will be used for different SUs or areas of the site based on different exposure scenarios, this information should be presented.

Response – The lowest (most conservative) PAL will be used for each constituent. Highlighting will be applied to the tables to reflect this.

- b) The leachability-based SSL is limited to a NC SSL for a single COC: 2,4-dinitrotoluene. Alternative soil screening levels protective of migration to groundwater, such as the Protection of Groundwater SSLs available on the RSL table, should be included in Worksheet #15-1.

Response - The NCSSLs will be added to Worksheet #15-1.

- c) The UFP-SAP indicates that the ESVs are EcoSSL or if no EcoSSL was available, the USEPA Region 4 value was selected. EPA has prepared an Interim Draft Supplemental Guidance for Ecological Risk Assessment (2015) that includes updated soil screening values for use in ecological risk assessments. Screening values for several COCs, including 1,3,5-trinitrobenzene, 1,3-dinitrobenzene and many others, are now available and should be incorporated into the UFP-SAP. The guidance is available online at https://www.epa.gov/sites/production/files/2015-09/documents/r4_era_guidance_document_draft_final_8-25-2015.pdf.

Response – The soil screening values will be updated in Worksheet#15-1.

- d) In Worksheet #15-2 for groundwater, nitrobenzene is the only COC with an ESV. The USEPA Region 4 Interim Draft Supplemental Guidance for Ecological Risk Assessment indicates that maximum groundwater chemical concentrations should be compared to the surface water screening values as a conservative scenario. Therefore, the surface water ESVs, available in the Interim Draft Supplemental Guidance, should be included as PALs for groundwater.

Response - The surface water ESVs will be added to Worksheet#15-2.

5) Worksheet #17 – Sampling Design and Rationale, Pages 65 and 66:

- a) Soil Sampling, Page 65 – The second paragraph in this section indicates that one five-point composite sample will be collected from each cell of a grid that will be placed on the SU containing an exceedance of screening criteria. This approach is inconsistent with the approach proposed in Worksheet #11, in which the need for further assessment does not hinge upon an exceedance of screening criteria, but on the results of a HHRS and, if necessary, a full risk assessment. Please clarify.

Response – The five-point composite sampling will occur if risk assessments for individual SUs indicate potential for unacceptable risk, or if NC SSLs are exceeded, as outlined in Figure 7a. The text will be clarified as follows:

If warranted (see Figure 7a), the distribution of contamination within SU(s) that contain concentrations of constituents that exceed NC SSLs and/or pose the potential for unacceptable risk will be assessed by collecting five-point composite surface soil samples as described in Worksheet #14. A grid layout will be placed on the SU and one five-point composite sample will be collected from each cell of the grid. The grid layout will be based on field conditions at the time of sampling; however, Figure 6 provides an example grid across SU 6. Grid cells will typically be 150-foot by 150-foot dimensions and will not exceed 200-foot by 200-foot dimensions.

6) Figure 6, Sampling Units:

- a) Figure 6 shows that the northwestern corner of UXO-28, which extends into the BEQ boundary, has not been incorporated into a sampling unit. If ISM sample collection will not be conducted in this area, please clarify how the area will be evaluated for nature and extent.

Response – The soil in this area has been re-worked and paved over by MILCON activities and thus is considered inaccessible. The figures will be updated with cross-hatching to reflect this.

- b) Sampling Unit 8 shows cross-hatching over a portion of Beaver Dam Creek, which, according to the legend, represents an impervious area. Please remove the cross-hatching from this area of the site.

Response – The cross-hatching over Beaver Dam Creek will be removed.

NCDEQ Comments (dated August 10, 2016)

- 1) The last paragraph on page 56 states, "The UXOQCS will inspect at least 10 percent of the intrusively investigated anomaly locations using the EM61-MK2 to determine whether the anomaly source was removed." If a high explosive (HE) is encountered during the investigation all (100%) anomalies should be confirmed to be removed using the EM61-MK2.

Response – Concur. The text will be revised to reflect this.

- 2) SAP Worksheet #16-Project Schedule/Timeline Table needs to be updated. The NCDEQ and EPA received this document for review on July 26, 2016 not May 9, 2016. Please make appropriate updates throughout the Table as required.

Response – Concur. The schedule will be updated.

- 3) The second paragraph under Soil Sampling on page 65 states that the Sampling Units (SU) at the site are approximately 5 acres each and 30 to 70 aliquots of soil will be collected from accessible areas of each unit. Five acres is a huge sampling unit area. Not sure how much meaning it would have (See my comment on Figure 7a).

Response –The 81-acre site has been divided into 10 SUs such that each is comprised of ~5 acres of exposure area (impervious cover not included). The SUs encompass areas of similar characteristics (wooded, open grassy fields, developed), such that receptors would be similar across each SU. Five acres is a reasonable exposure area for ecological receptors and human receptors based on site use (e.g., landscaping, recreational activities). Up to 70 aliquots are to be collected from each SU in triplicate for analysis of explosives residues and perchlorate. The average of triplicate results will be compared to PALs to determine if risk evaluation is necessary. If unacceptable risk or if NC SSLs are exceeded, additional focused sampling will occur.

- 4) Figure 4 shows the locations of MPPEH and MEC discovered during the Non-Time Critical Removal Action for Site UXO-23. Was all MPPEH confirmed to be Munitions Declared as Safe (MDAS)? Did we encounter any High Explosives (HE).

Response – All MPPEH was confirmed as MDAS and no HE items were encountered. The text will be updated for clarification.

- 5) Figure 7a, PQO Decision Flow chart, includes the decision "Does the average of the triplicates exceed P ALs and do risk assessments show potential unacceptable risk? Or were NC SSLs exceeded?" As I stated above the Sampling Units area very large, therefore, each ISM Sample should be reported and grid samples collected if the SSLs or risks are exceeded. Averaging the triplicates of large sampling units with ISM samples (30 to 70) like this would seem to give meaningless data results.

Response – Each ISM sample result will be included in the RI report. Per ITRC guidance, 3 ISM samples will be collected within each SU such that their results can be averaged for PAL comparison. Because the SU is considered an exposure area, it is assumed that receptors are exposed to all parts of the SU equally. The purpose of ISM is to estimate the true mean concentration of a constituent across an entire SU. Triplicate sampling provides 3 estimates of the mean, the average of which results in a more robust estimate of the true mean than any individual ISM result.