TETRA TECH

October 28, 2011

U.S. Environmental Protection Agency - Region II
290 Broadway - 22nd Floor
New York, New York 10007-1866

ATTN: Mr. Adolph Everett, P.E.
Chief, RCRA Programs Branch

RE: Contract N62470-08-D-1001
Contract Task Order (CTO) JM04
U.S. Naval Activity Puerto Rico (NAPR)
EPA I.D. No. PR2170032703
Response to Additional PREQB Comments Provided by USEPA July 28, 2011 on the Final Phase I RFI Report for SMWU 77 [Small Arms Range] and Comment Response Letter

Dear Mr. Everett:

Tetra Tech NUS, Inc., on behalf of the Navy, is pleased to provide you with responses to additional PREQB comments provided by USEPA on July 28, 2011 concerning the Phase I RFI Report (final dated April 2011) for Naval Activity Puerto Rico (NAPR) SWMU 77 [Small Arms Range]. Additional distribution has been made as indicated below.

If you have questions regarding this submittal, please contact Mr. Stacin Martin, NAVFAC Atlantic Remedial Project Manager (RPM) at 757-322-4780.

Sincerely,

Linda Klink

Linda Klink P.E.
Project Manager

LEK/cm
Attachments

cc: Ms. Debra Evans-Ripley, NAVFAC SE (letter only)
Mr. David Criswell, BRAC PMO SE (letter only)
Mr. Mark Davidson, BRAC PMO SE (1 hard copy and electronic via e-mail)
Mr. Stacin Martin, NAVFAC Atlantic (1 hard copy and electronic via e-mail)
Mr. Pedro Ruiz, NAPR (electronic via e-mail)
Mr. Tim Gordon, US EPA Region II (2 hard copies and electronic via e-mail)
Mr. Carl Soderberg, US EPA Caribbean office (1 electronic via e-mail)
Ms. Wilmarie Rivera, PR EQB (1 hard copy and electronic via e-mail)
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Mr. Felix Lopez, US F&WS (electronic via e-mail)
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Mr. James Pastoric, UXO Pro (electronic via e-mail)
Ms. Karen Vetrano, TRC Environmental (electronic via e-mail)
Mr. Mark Kimes, Baker Environmental (electronic via e-mail)
Ms. Bonnie Capito (Librarian), NAVFAC LANT (1 hard copy and 1 for Admin Record)
File N62470-08-D-1001, CTO JM04 112G02226 (1 hard copy)

RESPONSE TO PREQB COMMENTS PROVIDED BY USEPA JULY 28, 2011
TECHNICAL REIVEW OF THE NAVY'S RESPONSES TO PREQB'S COMMENTS
PHASE 1 RFI REPORT FOR SWMU 77–SMALL ARMS RANGE
DRAFT DATED OCTOBER 2010, REV. 1 DATED APRIL 2011
NAVAL ACTIVITY PUERTO RICO, CEIBA, PUERTO RICO

The Navy's responses to PREQB comments on the Phase 1 RCRA Facility Investigation Report for SWMU 77 are accepted, except as noted below.

Note that where the comment response provides revised text, text additions are shown in bold italics and deleted text is shown as strikethrough.

PAGE-SPECIFIC COMMENTS

1. **PREQB Comment 5, Page 4-2, Section 4.1.3:** Please discuss Navy use prior to 2007. Although specific records do not exist for Navy use prior to 2007, please discuss what is known about Navy use of this range from the 1940s to 2007 and related MC training, storage and usage.

   Response: *Appendix K-1 presents aerial photographs and an analysis of the aerial photography spanning 1936-1999. Text within this appendix provides a description of activity and features observed on each date of photography analyzed. During the analysis, small-arms ranges were observed on the northeast side of the base as early as 1958, and on all photographs through 1995. The following text has been added at the end of the first paragraph of Section 4.1.3:*

   "***Appendix K also provides aerial photographs of the area and an analysis of the aerial photography which spans from 1936 to 1999. Text within this appendix provides a description of the activity and features observed on each date of photography analyzed. SWMU 77 was historically used for small arms operations; however,*** [no?] ***potential munitions disposal or detonation operations are suspected based on these historical aerial photographs.***"

   PREQB Evaluation of Response: Please note suggested addition of "no" to final sentence.

   Follow-up Response: Based on review of historical aerial photographs, potential munitions disposal or detonation operations ARE suspected, but not known, at SWMU 77. Three "pits" were noted as being present on a 1958 aerial photograph immediately southwest of the range area. Therefore, "no" will not be added to the sentence. During the future Full RFI, intrusive investigation will be conducted and a determination made concerning munitions use in this Subarea.

2. **PREQB Comment 9, Page 4-11, Section 4.4.3:** Please include a discussion of the XRF data usability, since it is being included in the risk screening. This comment applies to Section 8.4.3 also.

   Response: *XRF screening results were not used in the human health risk screening calculations, human health risk ratios were only calculated for nitroglycerin and arsenic at*

certain subareas, on an as needed basis, as described in each individual section. The ecological screening-level hazard assessment consisted only of a comparison of positive detections to PALs, risk ratios were not calculated during the ecological risk screening. A qualitative evaluation of the XRF field screening data was conducted during the Field XRF/Laboratory Lead Data Correlation and is presented in each individual section and in Appendix I. Therefore, additional XRF data usability discussions were not added to text.

PREQB Evaluation of Response: Based on statements made in the text of the report, "correlated, calculated laboratory concentrations" calculated from XRF data were screened against the Project Action Limit (PAL; one example is in Section 4.4.2 at the bottom of page 10). Please discuss whether any areas were eliminated from further consideration based on a comparison of the correlated, calculated laboratory concentrations derived from XRF data, and discuss whether the XRF data meet data quality objectives for identifying clean areas of a site.

Follow-up Response: As per the Phase 1 UFP-SAP, XRF real-time measurements were used as a field-screening tool to ensure that samples were collected in the areas most likely to be contaminated within each subarea. The XRF field screening results were also used to determine which samples were sent to the fixed-base laboratory for analysis. Furthermore, the Project Team agreed that if a sufficiently good correlation was obtained between the field XRF and laboratory lead concentrations, the XRF data would be used to help delineate contamination for further investigations, for initial delineation of potential contamination, and for potential risk evaluations, if required.

XRF data were collected at three subareas during the Phase 1 RFI: Rifle Range Subarea, Pistol Range Subarea, and Former Pistol Range Subarea, all of these subareas are being carried forward to the Full RFI and no areas have been excluded from further evaluation based on XRF results. Samples were collected from biased locations (berms) where contamination, if present, would be detected; contamination was evident and no clean areas were identified based on XRF data.

3. **PREQB Comment 14, Page 4-16, Section 4.6:** Please add a discussion that describes Figure 4-8, including the rationale for selecting the exposure scenarios and receptors presented and the basis for the assumed complete and incomplete exposure pathways.

Response: *A paragraph has been added to Section 4.6 discussing the current and future receptors and the basis for the complete and incomplete exposure pathways on the Conceptual Site Model Figures.*

"***Figure 4-8 presents the updated CSM for the MC exposure pathways. From use of the Rifle Range there is potential contamination of the soil. The current or future receptors for the Rifle Range subarea are recreational users, commercial/industrial workers, outdoor workers, construction workers, trespassers, residents, and biota/critical ecological habitat. The human receptors at the rifle range may be exposed to potential contamination from surface soil, subsurface soil (from direct contamination or infiltration from surface soil) and groundwater (leaching of soil contamination). Stormwater is not present at the Rifle Range so the stormwater erosion runoff pathway is not complete. All of the human receptors would be exposed to surface soil and; therefore, complete exposure routes exist for exposure to surface soil from ingestion, direct contact,***

and inhalation of dust. For subsurface soil, outdoor workers, construction workers, and residents could potentially be exposed to subsurface soil while at the Rifle Range and; therefore, potentially complete pathways exist for exposure to subsurface soil from ingestion, direct contact, and inhalation of dust. Commercial/industrial workers, outdoor workers, construction workers, and residents could potentially be exposed to groundwater at the Rifle Range. Therefore, a potentially complete pathway exists for these receptors from exposure to groundwater through ingestion, dermal contact, and inhalation."

PREQB Evaluation of Response: Please verify that no stormwater is present at the site. It is unlikely that stormwater would not be present during rain events. Please clarify and indicate whether any erosion or depositional features were identified at the site. This evaluation also applies to PREQB Comment 18, Page 5-14, Section 5.8.

Follow-up Response: Agree that stormwater would be present at the subareas during rain events. However, there are no ditches or streams present within the subareas and these areas are heavily vegetated. Therefore, erosion is not a concern at any of the subareas and so the stormwater erosion pathway was not considered complete in the Phase 1 RFI. Severe erosion of the roadway leading into SWMU 77 has recently been noted; however, erosion depositional features associated with the roadway would not be associated with and/or carry contamination from or on to a Subarea.

4. **PREQB Comment 20, Page 7-10, Section 7.9:** Please discuss the potential for migration of nitroglycerin and other COPCs to subsurface soil and groundwater.

Response: *The following text has been added discussing the potential migration of nitroglycerin and arsenic the COPCs for the Detonation subarea.*

"***Arsenic and NG were the COPCs for the Detonation Subarea. Arsenic found in soil is either naturally occurring or from anthropogenic releases in the form of insoluble complexes with iron, aluminum, and magnesium oxides found in surface soil, and in these forms, arsenic is relatively immobile. However, under reducing conditions, arsenic can be released from the solid phase, resulting in soluble mobile forms of arsenic, which may potentially leach into groundwater (ATSDR, August 2007). NG contains a hydrocarbon chain, which renders it susceptible to aerobic biodegradation; it is sufficiently biodegradable that mobility is seldom an issue and so usually will be attenuated before reaching groundwater. When NG is bound with nitrocellulose it is not susceptible to degradation in soil until the nitrocellulose is weathered away. In such circumstances, a low-level of NG will remain in the soil but will have no impact on groundwater (US Army Corps, 2006).***" *(Also, the references were added to the reference list.)*

PREQB Evaluation of Response: Please add some conclusions about whether leaching to the subsurface and groundwater is possible or likely at this site based on the information provided in this response. This evaluation applies to PREQB Comment 21, Page 8-2, Section 8.1.4 also.

Follow-up Response: It is assumed that NG present would degrade before reaching groundwater and it is unlikely that NG would leach to subsurface and groundwater. Depending on soil conditions, it is possible that arsenic may leach to groundwater.

During the Full RFI, the Phase 1 RFI data and Full RFI data will be combined and all data will be fully evaluated, via screening against USEPA protection of groundwater SSL values, as part of the human health risk assessment.

Appendix I, XRF/FBL Correlation Statistical Analysis

1. **PREQB Comment 1:** Please present the statistical analysis that was conducted that shows the highest XRF sample concentration was an outlier.

   Response: *The supporting graphical evaluations (boxplot and a histogram) along with Tukey's Outlier Test that were used to determine that the highest XRF sample concentration was an outlier were added to Appendix I, including supplementary text and a figure. The graphical evaluation of the XRF concentrations and the Tukey outlier test, was the basis for concluding that the maximum XRF concentration was an outlier and should be removed from the correlation analysis.*

   PREQB Evaluation of Response: If there are two populations, as suggested in the response to Comment 4 on Appendix I, please clarify why these two populations were treated as a single population for the outlier text for the largest XRF concentration.

   Follow-up Response: Outlier evaluations are typically the first step of any statistical evaluation and were therefore done before any regression analysis was conducted. For that reason, the outlier evaluation included all the data and was not done on the two separate populations that were found during the second step of the statistical evaluation (i.e., regression analysis).

2. **PREQB Comment 4:** Please provide the justification for selecting 400 mg/kg as the concentration at which the dataset is split into two groups - one representing data below 400 mg/kg and one representing data above 400 mg/kg. Note that the equations used to predict laboratory concentrations from XRF data do not converge at 400 mg/kg, resulting in vastly different predicted lab concentrations for XRF near 400 mg/kg. The equations from Figures 2 and 3 in Appendix I would predict lab concentrations of 672 mg/kg and 1988 mg/kg for XRF concentrations of 399.9 mg/kg and 400.1 mg/kg respectively. Please address this issue as part of the justification and discuss the predicted laboratory results for XRF data immediately below and above 400 mg/kg.

   Response: *Based on the scatterplot of the data it appears that the lower concentrations follow a different slope than the higher concentrations. This indicates that the two subgroups may come from different populations and; therefore, different regression models would be required to estimate the fixed base lab concentrations. 400 mg/kg was chosen as the concentration at which the dataset is split into two groups based on the visual examination of the data. Concentrations should only be predicted for the observed concentration range. Based on the way the data was split, there is no overlap of observed concentrations. The utility of using XRF screening for delineation and characterization of lead contamination vs. fixed-based laboratory analysis will be discussed further during the Full RFI project planning.*

   PREQB Evaluation of Response: The response indicates that two regression models were used because the two sub-groups (<400 mg/kg and >400 mg/kg) potentially

belonged to two separate populations. Please clarify if these populations are merely statistical in nature or if there is a physical difference (e.g. the higher concentration population is clustered around specific part of the site from the lower concentration or a different depth). Also, based on analysis of the data in the newly included Appendix I, Table 1, a regression equation of LAB = 0.6884 x XRF^1.144 appears to fit the entire data set (minus the outlier) better than either of the separate linear models. Please address. As stated in our evaluation of the Navy's response to PREQB Comment 9, please clarify whether the correlated, calculated laboratory data was used to make decisions concerning whether areas were clear or contaminated. If so, agreement needs to be made on the appropriate correlation used to derive data used to make such decisions.

Follow-up Response: The measure of the fit of the regression model was based on the correlation, r, and the R^2 values. The r and R^2 values for the model showing concentrations from 0 to 400 mg/kg are larger than the r and R^2 values for the data lumped together as one model. Furthermore if there is evidence that two populations are present then two models are warranted and the data should not be lumped together. The populations are statistical in nature. The data from the three sites where XRF samples were collected were combined (Rifle Range, Pistol Range, and Former Pistol Range). Within these three sites the data from the statistical populations (i.e., XRF concentrations less than 400 mg/kg and XRF concentrations greater than 400 mg/kg) are not clustered by location and are instead spread out throughout each site.

Refer to response to the evaluation of Navy's response to PREQB Comment 9 (Comment 2 response) above, XRF real-time measurements were used as a field-screening tool to ensure that samples were collected in the areas most likely to be contaminated within each subarea and to determine which samples were sent to the fixed-base laboratory for analysis.

3. **New PREQB Comment on Appendix I:** Sample 77FP-SS004-G00.5 appears as both the first and last entry to the new Table 1 in Appendix I. Please clarify.

Response: Agree that 77FP-SS004-G00.5 was inadvertently included twice. The Full RFI SAP will include the Phase 1 RFI data, including the updated Appendix I, X-Ray Fluorescence/Fixed-Base Laboratory Correlation Statistical Evaluation. The Phase 1 RFI will not be revised for this minor change.