

Modified Sampling Approach for Preliminary Assessment/Site Inspection (PA/SI) at UXO-12 (ASR#2.5) New River 1,000-inch Range and UXO-18 (ASR#2.44) B-6 50-Foot Small Arms Range, Marine Corps Base Camp Lejeune (MCB CamLej)

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Site conditions at UXO-12 (ASR#2.5) New River 1,000-inch Range and UXO-18 (ASR#2.44) B-6 50-Foot Small Arms Range have significantly changed since the work plan was finalized. These changes resulted from several heavy precipitation events and continued standing water across the majority of investigation areas. It has been determined that the original sampling approach cannot be implemented at these sites. This technical memorandum presents a modified sampling approach to complete the PA/SI to evaluate the presence and nature of impacts from munitions constituents at UXO-12 and UXO-18 through the sampling of soil, sediment, surface water, and groundwater.

Original Sampling Approach

As detailed in the *Site Specific Work Plan Addendum for Preliminary Assessment/Site Inspection, Site UXO-12 New River 1,000-inch Range (ASR #2.5) and UXO-18 50-foot Small Bore Range (ASR #2.44)* (CH2M HILL, 2009), the original sampling approach for UXO-12 and UXO-18 included collection of the following environmental samples:

- 536 surface soil samples screened in the field with an X-ray fluorescence (XRF) instrument
- 134 surface soil samples, using the TR-02-1 multi-increment sampling method
- 44 subsurface soil samples
- 44 groundwater samples
- 10 surface water samples
- 10 sediment samples
- Additional sample locations to be added if indicated by XRF screening results

All samples are to be analyzed for antimony, arsenic, copper, lead, and zinc by USEPA Method 6010B. Original sample locations are shown in **Figure 1**.

UXO-12 and UXO-18 Investigation Activities to Date

During the site visit in preparation for developing the work plan, site conditions were dry and the investigation area was accessible. Field investigation activities at UXO-12 and UXO-18 began in October 2009 and surface soil sampling began on November 9, 2009. Initial surveying and vegetation clearing efforts identified low-lying, inaccessible wetland areas in isolated locations throughout the 176-acre site. Eight surface soil sampling locations and 39 XRF screening locations were removed from the sampling plan, as they were within roadways, construction areas, or wildlife feed plots. During the November field event, 118 of the proposed 536 XRF surface soil field screenings were completed and 30 of the 134 proposed surface soil samples were collected, primarily in the northern portion of the site. Heavy rainfall occurred in the Jacksonville, North Carolina area from November 10 through November 12, 2009, causing flooding throughout the investigation area, with standing water at depths up to 12 inches. Field efforts were suspended.

Four subsequent site visits have been made to assess conditions and evaluate when sampling could resume. These visits were conducted between December 2009 and February 2010. Although standing water has receded in many areas, flooded conditions are still present in some areas of UXO-12 and UXO-18, and saturated soils are still present throughout most of the site.

The available surface soil data collected from the initial mobilization are only sufficient to characterize the northern end of the site (Figure 1).

Modified Sampling Approach

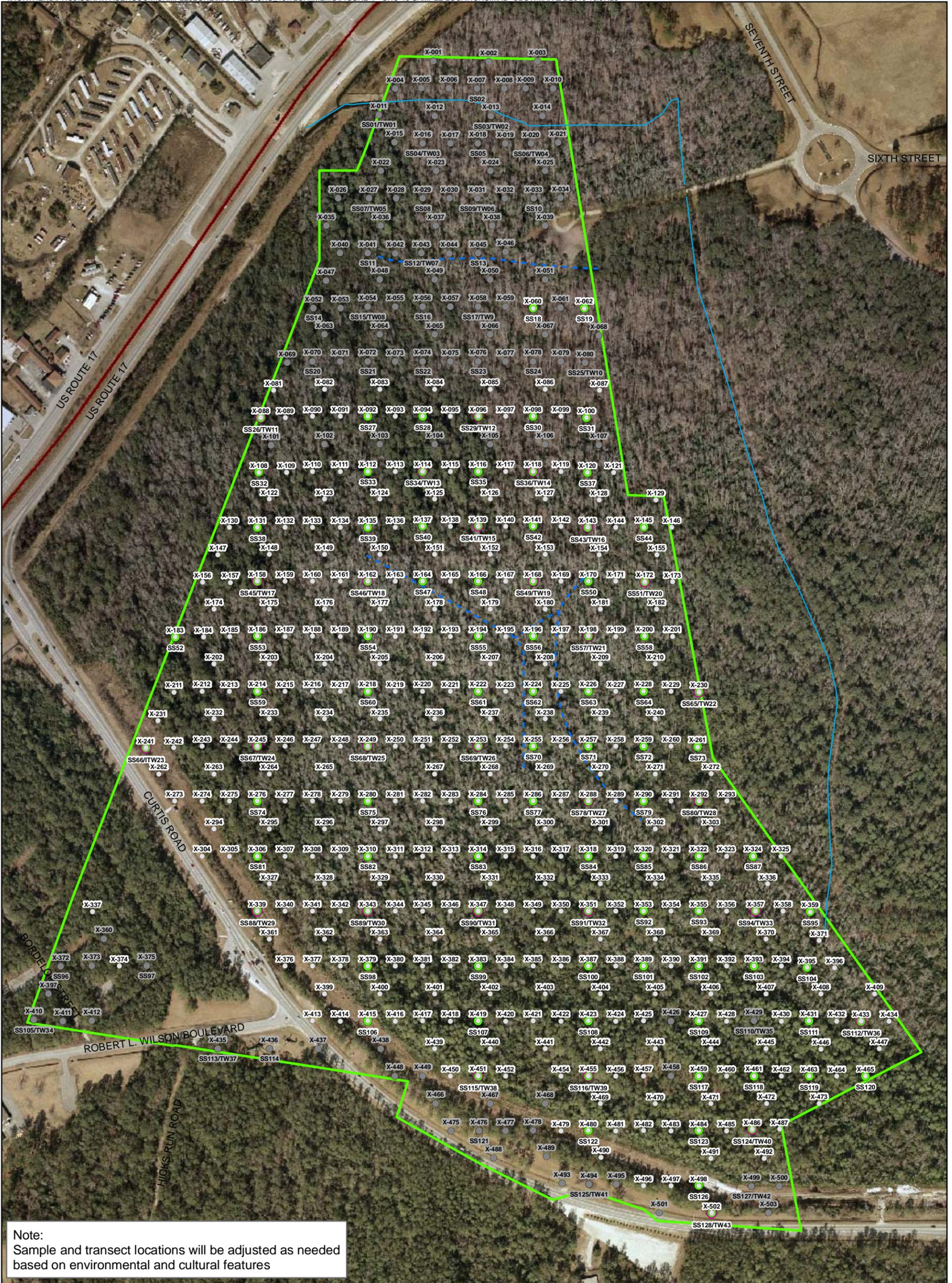
Flooded and saturated site conditions prevent further collection of data since XRF screening is inaccurate for soils with moisture contents greater than 20% and TR02-01 multi-increment sampling cannot be conducted at locations with standing water. Additionally, subsurface and groundwater sampling capabilities are limited because drill rigs and support vehicles are currently unable to access most of the site. Therefore, the following modified soil sampling approach is proposed for the UXO-12 and UXO-18 PA/SI effort:

- The remaining XRF field screening samples will be removed from the sampling plan.
- Grab samples will replace the samples to be collected with the TR02-01 multi-increment sampling method (**Figure 2**).
- There will be no change to the fixed-based lab analyses.

This modified sampling approach will allow for PA/SI sampling activities to resume. The saturated conditions will continue to be monitored and, based on the results of these analytical data, additional surface soil, subsurface soil, and/or groundwater samples will be collected as necessary to complete the investigation when site conditions allow.

References

CH2M HILL. 2009. *Site Specific Work Plan Addendum for Preliminary Assessment/Site Inspection, Site UXO-12 New River 1,000-inch Range (ASR #2.5) and UXO-18 50-foot Small Bore Range (ASR #2.44), Marine Corps Base Camp Lejeune, Jacksonville, North Carolina. 28 September.*



Note:
Sample and transect locations will be adjusted as needed based on environmental and cultural features

Legend

- Sampled Locations
- Proposed XRF Soil Screening Location
- Surface Soil Sample Location
- Surface/Subsurface Soil/Temporary Sample Location
- - - Creek (impassable)
- Surface Water Course Centerline

- Site UXO-18 Boundary
- Installation Boundary

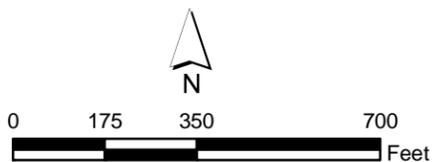


Figure 1
UXO-18 Sample Locations
Tech Memo
MCB CamLej
North Carolina



Note:
Sample and transect locations will be adjusted as needed based on environmental and cultural features

Legend

- Sampled Locations
- Surface Soil Sample Location
- - - Creek (impassable)
- Surface Water Course Centerline
- Site UXO-18 Boundary
- Installation Boundary

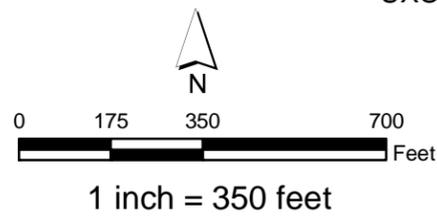


Figure 2
UXO-18 Surface Soil Sample Locations
Tech Memo
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