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FINAL TECHNICAL MEMORANDUM REGARDING ADDENDUM TO THE SAMPLING AND ANALYSIS PLAN FOR PRE-REMOVAL VERTICAL CONFIRMATORY SAMPLING OF OPERABLE UNIT 1, SITE 2 (SCOTT CENTER LANDFILL) UPLAND SOILS NSY NORFOLK VA

11/9/2004

CH2M HILL

Addendum to the Sampling & Analysis Plan for Pre-Removal Vertical Confirmatory Sampling of Operable Unit 1, Site 2 (Scott Center Landfill) Upland Soils

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DATE: November 9, 2004

Introduction

This memorandum serves as an addendum to the *Sampling and Analysis Plan for Pre-Removal Vertical Confirmatory Sampling of Operable Unit 1, Site 2 (Scott Center Landfill) Marsh Sediments*, (CH2MHIL, 2004) to incorporate the sampling and analysis approach for pre-removal vertical confirmatory sampling of upland soils at Operable Unit (OU) 1, Site 2 (Scott Center Landfill) at the Norfolk Naval Shipyard (NNSY) in Portsmouth, Virginia. The purpose of this confirmatory sampling is to determine, prior to implementation of removal activities, the depth(s) to which upland soil excavation will take place and confirmation that Remedial Action Cleanup Goals (RACGs) are achieved.

Horizontal delineation of the extent of landfill removal was determined based on results of a waste delineation investigation (CH2M HILL, 2003b). Figure 1 shows the horizontal boundary of the Scott Center Landfill and establishes 60-foot by 60-foot grids for the purpose of pre-removal vertical confirmatory sampling. The horizontal and vertical extent of marsh sediment removal was determined by pre-confirmatory sampling results (CH2M HILL, 2004a). Confirmatory sampling was conducted for the metals for which site-specific remediation goals (CH2M HILL, 2003a) were developed and are based on the RACGs (CH2M HILL, 2004a) established for OU1. The horizontal and vertical removal action boundary for marsh sediment was agreed upon by the NNSY Project Management Team (PMT).

Prior to beginning any marsh sediment removal activities at the site, a *Sampling and Analysis Plan for Pre-Removal Vertical Confirmatory Sampling of Operable Unit 1, Site 2 (Scott Center Landfill) Marsh Sediments*, (CH2MHIL, 2004c) was developed that details the sampling and analysis protocols and approach agreed to by the NNSY Project Management Team (PMT) for determining limits of excavation. This addendum describes the sampling and analysis protocols and approach for determining the vertical extent of upland soil/landfill removal and confirmation that RACGs are achieved.

Sampling Approach

The Scott Center removal action contractor previously excavated a number of test pits (approximately 15 to 20 during the week of October 19th, 2004) throughout the landfill area to guage the actual depth of waste and to determine the contents of the landfill for waste disposal purposes. The northwestern portion of the landfill consists largely of soil and concrete debris. The concrete debris transitions into industrial waste (blast grit) for the rest of the landfill. The fill containing the blast grit is intermixed with other types of debris (e.g., hoses, construction debris, and metal straps). It was also determined from the test pits that the bottom soils under the landfill are natural and very homogenous and consist of fine sands and green sandy clay.

A sample was collected from each soil type (sand and green sandy clay) to characterize these soils with respect to RACGs. The results are depicted in Table 1 and indicate both soil types to be well below the RACGs. These soil samples were collected from beneath the landfill waste, where clean native soil was encountered (Figure 1), one from the fine sand (CS01) and one from the sandy clay (CS02).

Given the homogeneous nature of the soils underlying the landfill, the collection of confirmatory soil samples from beneath the landfill waste in advance of the actual removal of the landfill waste will expedite landfill excavation, reduce the potential for nuisance water impacting the project site, and reduce the need to temporarily stage excavated material. This approach will allow for direct loading of landfill waste to trucks for off-site disposal.

The proposed vertical pre-removal confirmatory sampling approach for the upland soils at OU1 is based on a similar approach used for the marsh sediments. The proposed approach consists of gridding the landfill area into 3,600 sq ft grid cells and collecting a discrete sample of native soil beneath landfill waste from each grid cell. Figure 1 shows the gridded site layout for confirmation sampling. Specifically, the OU1 upland soils confirmatory sampling approach is as follows:

- The landfill area was gridded into 60x60 ft areas resulting in 20 cells.
- Discrete confirmatory samples will be collected at three depths (clean bottom, clean bottom -1.0 ft, and clean bottom -2.0 ft) from the center of each grid cell (except grids 3 and 12, which have already been confirmed to achieve RACGs at clean bottom). An excavator will be used to reach clean bottom and to collect the samples. Clean bottom is considered to be the depth at which native soil is encountered below the landfill waste materials.
- The samples will be analyzed for the 12 metals for which RACGs were developed (CH2M HILL, 2003a).
- The excavated clean bottom sample will be analyzed first for each grid cell. If any constituent exceeds the RACG in this excavation bottom sample, the clean bottom –1–ft sample depth for that grid cell will then be analyzed. Similarly, if any constituent exceeds the RACG at the clean bottom–1–ft sample depth, then the clean bottom–2-ft sample depth for that grid cell will then be analyzed.

- All sampling locations and depth will be surveyed using a GPS unit.

Figure 1 shows the horizontal boundary of the landfill and the 20 grid cells for vertical pre-confirmation sampling. All sampling will be conducted in accordance with the NNSY Master Project Plans (CH2M HILL 2000 a, 2000b, and 2000c) and the attached quality control checklists.

Analysis Approach

Each sample from the excavation clean bottom (0-ft), clean bottom -1-ft and clean bottom -2-ft depths will be analyzed for the 12 metals for which RACGs were developed, using USEPA Contract Laboratory Program (CLP) Inorganic Low to Medium method 4 (ILM04). The 12 constituents of concern (COCs) include arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium and zinc. The RACG values and Contract Requested Reporting Limits (CRDLs) for each of these metals are listed in Table 2 below.

Table 2: RACG & CRDL Values for the 12 COCs

COC	RACG, CRDL (mg/kg)	COC	RACG, CRDL (mg/kg)
Arsenic	24, 2	Copper	353, 5
Barium	72, 40	Lead	411, 0.6
Beryllium	2, 1	Mercury	1.47, 0.1
Cadmium	1.1, 1	Nickel	84, 8
Chromium	198, 2	Selenium	7, 1
Cobalt	98, 10	Zinc	643, 4

The vertical boundary for excavation will be determined based on achieving RACGs at the excavation clean bottom, clean bottom -1-ft, or clean bottom -2-ft sample. The excavation clean bottom sample will be analyzed first for each grid cell. If any constituent exceeds the RACG in this excavation bottom sample, then the clean bottom –1–ft sample depth for that grid cell will then be analyzed. Similarly, if any constituent exceeds the RACG at the clean bottom–1–ft sample depth, then the clean bottom –2-ft sample depth for that grid cell will then be analyzed.

Each grid cell will be backfilled with clean material to the appropriate depth to support the construction of a tidal wetland. If the clean bottom -2-ft bgs sample in any one of the grid cells exceeds the RACGs, additional samples to greater depths may be collected to assess the feasibility of deeper excavation. If it is not feasible to achieve a RACG in any given cell, the NNSY PMT will consider monitoring soil/sediment in that grid cell of the created wetlands to ensure contamination does not migrate upward into the clean backfill.

Quality Assurance/Quality Control

Quality Assurance/Quality Control (QA/QC) procedures are described in the Master QA/QC Project Plans (QAPP) (CH2M HILL, 2000a). Data will be collected to meet high-level Data Quality Objectives (DQOs) as described in the Master QAPP. Field QA/QC samples will be collected as follows for analytical samples:

Table 3: QA/QC Sample Description

Type of QA/QC Sample	Collection Frequency
Field Duplicate	One per group of up to 10 samples
Field Blank	One per sampling event (aqueous sample)
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per group of up to 20 samples

An equipment blank will not be required, as all sampling will be conducted using disposable supplies. Analytical results will be validated by an independent data validator using USEPA Region III modifications to the National Functional Guidelines, as described in the Master Project Plans for NNSY (CH2M HILL, 2000b).

Field Sampling Procedures

All sample containers will be provided by the laboratory subcontractor in a clean and, if appropriate, pre-preserved state, as defined in the Master QAPP (CH2M HILL, 2000a). The laboratory will provide American Society for Testing & Materials (ASTM) Type II water for QA/QC samples. A 48-hour turnaround time will be used for all analytical samples. The following table summarizes the samples that will be collected as part of this sampling event.

Table 4: Sample Summary

Lab Parameter	# Samples	# Field Duplicates	# Field Blanks	# Matrix Spikes	# Matrix Spike Duplicates
Arsenic	18	1	1	1	1
Barium	18	1	1	1	1
Beryllium	18	1	1	1	1
Cadmium	18	1	1	1	1
Chromium	18	1	1	1	1
Cobalt	18	1	1	1	1
Copper	18	1	1	1	1

Lead	18	1	1	1	1
Mercury	18	1	1	1	1
Nickel	18	1	1	1	1
Selenium	18	1	1	1	1
Zinc	18	1	1	1	1

Note: No trip blank will be collected since no volatile organic compound (VOC) analysis will be conducted. MS/MSDs will be prepared and performed in the laboratory by the analytical subcontractor.

Health & Safety

The Health & Safety Plan (HASP) for NNSY (CH2M HILL, 2000c) addresses the tasks to be performed as part of this sampling event. The plan will be updated, as appropriate, to address issues specific to the site and sampling event (dates, personnel, etc.).

References

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